SERVICE AND PARTS MANUAL
FRYMASTER BIELA14 SERIES
LOV™ ELECTRIC FRYER

This equipment chapter is to be installed in the Fryer Section of the *Equipment Manual.*

FOR YOUR SAFETY
Do Not Store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

Low Oil Volume Fryer



MANUFACTURED BY

Frymaster

Enodis
One Company, Countless Solutions

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MAY 2008

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8196315

NOTICE

IF, DURING THE WARRANTY PERIOD, THE CUSTOMER USES A PART FOR THIS ENODIS EQUIPMENT OTHER THAN AN UNMODIFIED NEW OR RECYCLED PART PURCHASED DIRECTLY FROM FRYMASTER DEAN, OR ANY OF ITS AUTHORIZED SERVICE CENTERS, AND OR THE PART BEING USED IS MODIFIED FROM ITS ORIGINAL CONFIGURATION, THIS WARRANTY WILL BE VOID. FURTHER, FRYMASTER DEAN AND ITS AFFILIATES WILL NOT BE LIABLE FOR ANY CLAIMS, DAMAGES OR EXPENSES INCURRED BY THE CUSTOMER WHICH ARISE DIRECTLY OR INDIRECTLY, IN WHOLE OR IN PART, DUE TO THE INSTALLATION OF ANY MODIFIED PART AND/OR PART RECEIVED FROM AN UNAUTHORIZED SERVICE CENTER.

NOTICE

This appliance is intended for professional use only and is to be operated by qualified personnel only. A Frymaster Dean Factory Authorized Service Center (FASC) or other qualified professional should perform installation, maintenance, and repairs. Installation, maintenance, or repairs by unqualified personnel may void the manufacturer's warranty.

NOTICE

This equipment must be installed in accordance with the appropriate national and local codes of the country and/or region in which the appliance is installed.

⚠ DANGER

All wiring connections for this appliance must be made in accordance with the wiring diagrams furnished with the equipment. Wiring diagrams are locted on the inside of the fryer door.

NOTICE TO U.S. CUSTOMERS

This equipment is to be installed in compliance with the basic plumbing code of the Building Officials and Code Administrators International, Inc. (BOCA) and the Food Service Sanitation Manual of the U.S. Food and Drug Administration.

NOTICE TO OWNERS OF UNITS EQUIPPED WITH COMPUTERS

U.S.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1) This device may not cause harmful interference, and 2) This device must accept any interference received, including interference that may cause undesired operation. While this device is a verified Class A device, it has been shown to meet the Class B limits.

CANADA

This digital apparatus does not exceed the Class A or B limits for radio noise emissions as set out by the ICES-003 standard of the Canadian Department of Communications.

Cet appareil numerique n'emet pas de bruits radioelectriques depassany les limites de classe A et B prescrites dans la norme NMB-003 edictee par le Ministre des Communcations du Canada.

⚠ DANGER
Improper installation, adjustment, maintenance or service, and unauthorized alterations or modifications can cause property damage, injury, or death. Read the installation, operating, and service instructions thoroughly before installing or servicing this equipment.

⚠ DANGER
The front ledge of this appliance is not a step! Do not stand on the appliance. Serious injury can result from slips or contact with the hot oil.

⚠ DANGER
Do not store or use gasoline or other flammable liquids or vapors in the vicinity of this or any other appliance.

⚠ DANGER
The crumb tray in fryers equipped with a filter system must be emptied into a fireproof container at the end of frying operations each day. Some food particles can spontaneously combust if left soaking in certain shortening material.

⚠ WARNING
Do not bang fry baskets or other utensils on the fryer's joiner strip. The strip is present to seal the joint between the fry vessels. Banging fry baskets on the strip to dislodge shortening will distort the strip, adversely affecting its fit. It is designed for a tight fit and should only be removed for cleaning.

⚠ DANGER
Adequate means must be provided to limit the movement of this appliance without depending on or transmitting stress to the electrical conduit. A restraint kit is provided with the fryer. If the restraint kit is missing contact your local Frymaster Factory Authorized Service Center (FASC) for part number 826-0900.

⚠ DANGER
This fryer has two power cords and prior to movement, testing, maintenance and any repair on your Frymaster fryer; disconnect both electrical power cords from the electrical supply.

⚠ WARNING
Do not use water jets to clean this equipment.

LOV™ ELECTRIC WARRANTY STATEMENT

Frymaster, L.L.C. makes the following limited warranties to the original purchaser only for this equipment and replacement parts:

A. WARRANTY PROVISIONS - FRYERS

1. Frymaster L.L.C. warrants all components against defects in material and workmanship for a period of two years.

2. All parts, with the exception of the frypot, O-rings and fuses, are warranted for two years after installation date of fryer.

3. If any parts, except fuses and filter O-rings, become defective during the first two years after installation date, Frymaster will also pay straight-time labor costs up to two hours to replace the part, plus up to 100 miles/160 km of travel (50 miles/80 km each way).

B. WARRANTY PROVISIONS - FRYPOTS

If a frypot develops a leak within ten years after installation, Frymaster will, at its option, either replace the entire battery or replace the frypot, allowing up to the maximum time per the Frymaster time allowance chart hours of straight-time labor. Components attached to the frypot, such as the high-limit, probe, gaskets, seals, and related fasteners, are also covered by the ten-year warranty if replacement is necessitated by the frypot replacement. Leaks due to abuse or from threaded fittings such as probes, sensors, high-limits, drain valves or return piping are not included.

C. PARTS RETURN

All defective in-warranty parts must be returned to a Frymaster Authorized Factory Service Center within 60 days for credit. After 60 days, no credit will be allowed.

D. WARRANTY EXCLUSIONS

This warranty does not cover equipment that has been damaged due to misuse, abuse, alteration, or accident such as:

- improper or unauthorized repair (including any frypot which is welded in the field);
- failure to follow proper installation instructions and/or scheduled maintenance procedures as prescribed in your MRC cards. Proof of scheduled maintenance is required to maintain the warranty;
- improper maintenance;
- damage in shipment;
- abnormal use;
- removal, alteration, or obliteration of either the rating plate or the date code on the heating elements;

- operating the frypot without shortening or other liquid in the frypot;
- no fryer will be warranted under the ten-year program for which a proper start-up form has not been received.

This warranty also does not cover:

- transportation or travel over 100 miles/160 km (50 miles/80 km each way), or travel over two hours;
- overtime or holiday charges;
- consequential damages (the cost of repairing or replacing other property which is damaged), loss of time, profits, use or any other incidental damages of any kind.

There are no implied warranties of merchantability or fitness for any particular use or purpose.

This warranty is applicable at the time of this printing and is subject to change.

ELECTRICAL POWER SPECIFICATIONS

VOLTAGE	PHASE	WIRE SERVICE	MIN. SIZE	AWG (mm^2)	AMPS PER LEG		
					L1	L2	L3
208	3	3	6	(16)	39	39	39
240	3	3	6	(16)	34	34	34
480	3	3	8	(10)	17	17	17
220/380	3	4	6	(16)	21	21	21
240/415	3	4	6	(16)	20	20	21
230/400	3	4	6	(16)	21	21	21
230/400 **France Only**	3	4	6	(16)	25	25	25

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CHAPTER 1: SERVICE PROCEDURES

1.1 General

Before performing any maintenance on your Frymaster fryer, disconnect the fryer from the electrical power supply.

⚠ WARNING
To ensure the safe and efficient operation of the fryer and hood, the electrical plug for the 120-volt line, which powers the hood, must be fully engaged and locked in its pin and sleeve socket.

When electrical wires are disconnected, it is recommended that they be marked in such a way as to facilitate re-assembly.

1.2 Replacing a Computer

1. Disconnect the fryer from the electrical power supply.
2. The controller bezel is held in place by tabs at the top and bottom. Slide the metal bezel up to disengage the lower tabs. Then slide the bezel down to disengage the upper tabs.
3. Remove the two screws from the upper corners of the control panel. The control panel is hinged at the bottom and will swing open from the top.
4. Unplug the wiring harnesses from the connectors on the back of the computer, marking their position for reassembly, and disconnect the grounding wires from the terminals. Remove the control panel assembly by lifting it from the hinged slots in the control panel frame.



5. Remove the controller from the control panel assembly and install the replacement computer. Reinstall the control panel assembly by reversing steps 1 thru 4.
6. Setup the computer following the instructions on page 4-9 in the Installation and Operation manual.
7. Readdress the new M2007 computer. The readdress procedure can be performed from any one M2007 computer in the bank. See section 1.14.2 on page 1-32 for instructions to readdress the computer.

1.3 Replacing Component Box Components

1. Disconnect the fryer from the electrical power supply.

2. The controller bezel is held in place by tabs at the top and bottom. Slide the metal bezel up to disengage the lower tabs. Then slide the bezel down to disengage the upper tabs.

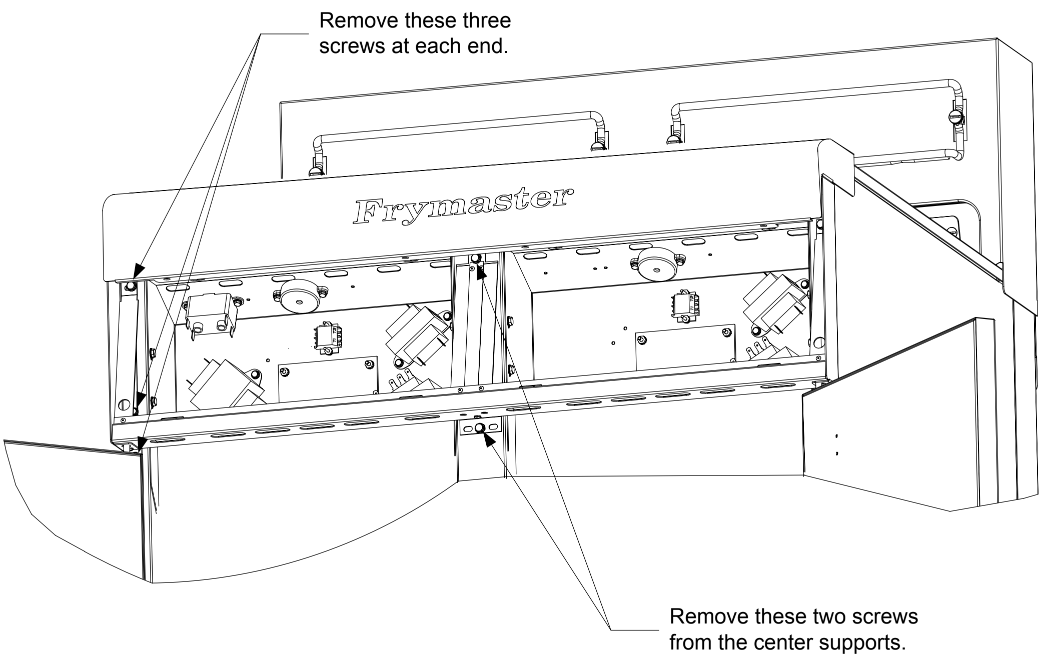
3. Remove the two screws from the upper corners of the control panel and allow the control panel to swing down.

4. Unplug the wiring harnesses and disconnect the grounding wires from the terminals on the back of the controller. Remove the control panel assembly by lifting it from the hinge slots in the control panel frame.

5. Disconnect the wiring from the component to be replaced, being sure to make a note of where each wire was connected.

6. Dismount the component to be replaced and install the new component, being sure that any required spacers, insulation, washers, etc. are in place.

   NOTE: If more room to work is required, the control panel frame assembly may be removed by removing the hex-head screws which secure it to the fryer cabinet (see illustration below). If this option is chosen, all control panel assemblies must be removed per steps 1 and 2 above. The cover plate, on the lower front of the component box, may also be removed to allow additional access if desired. *Removing the component box itself from the fryer is not recommended due to the difficulty involved in disconnecting and reconnecting the oil-return valve rods, which pass through openings in the component box.*



Removing the Control Panel Frame and Top Cap Assembly

7. Reconnect the wiring disconnected in step 5, referring to your notes and the wiring diagrams on the fryer door to ensure that the connections are properly made. Also, verify that no other wiring was disconnected accidentally during the replacement process.

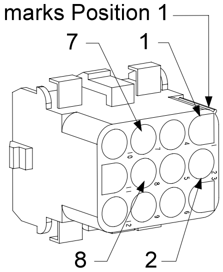
8. Reverse steps 1 through 4 to complete the replacement and return the fryer to service.

1.4 Replacing a High-Limit Thermostat

1. Remove the filter pan and lid from the unit. Drain the frypots into an McDonald's Shortening Disposal Unit (MSDU) or other appropriate **METAL** container using the computer "drain to pan option" or using the MIB board in manual mode.

DANGER
DO NOT drain more than one full frypot or two split frypots into the MSDU at one time.

2. Disconnect the fryer from the electrical power supply and reposition it to gain access to the rear of the fryer.
3. Remove the screws from the bottom of the lower back panel attaching the contactor plug guards.
4. Remove each of the guards.
5. Remove the four screws from both the left and right sides of the lower back panel.
6. Locate the high-limit that is being replaced and follow the two-black wires to the 12-pin connector C-6. Note where the leads are connected prior to removing them from the connector. Unplug the 12-pin connector C-6 and using a pin-pusher push the pins of the high-limit out of the connector.
7. Carefully unscrew the high-limit thermostat to be replaced.
8. Apply Loctite™ PST 567 or equivalent sealant to the threads of the replacement and screw it securely into the frypot.
9. Insert the leads into the 12-pin connector C-6 (see illustration below). For full-vat units or the left half of a dual-vat unit (as viewed from the rear of the fryer) the leads go into positions 1 and 2 of the connector. For the right half of a dual-vat unit (as viewed from the rear of the fryer), the leads go into positions 7 and 8. In either case, polarity does not matter.



High-Limit Lead Positions

10. Reconnect the 12-pin connecting plug C-6. Use wire ties to secure any loose wires.

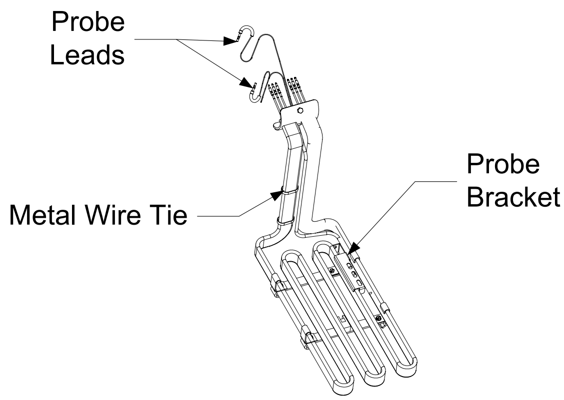
11. Reinstall the back panels, contactor plug guards, reposition the fryer under the exhaust hood, and reconnect it to the electrical power supply to return the fryer to service.

1.5 Replacing a Temperature Probe

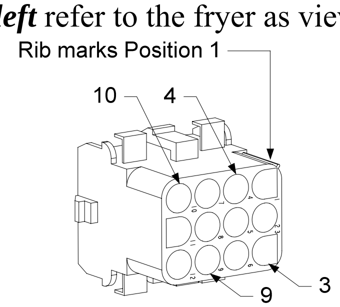
1. Remove the filter pan and lid from the unit. Drain the frypots into a McDonald's Shortening Disposal Unit (MSDU) or other appropriate **METAL** container using the computer "drain to pan option" or using the MIB board in manual mode.

DANGER
DO NOT drain more than one full frypot or two split frypots into the MSDU at one time.

2. Disconnect the fryer from the electrical power supply and reposition it to gain access to the rear of the fryer.
3. Remove the screws from the bottom of the lower panel attaching the contactor plug guards.
4. Remove each of the guards.
5. Remove the four screws from both sides of the lower back panel. Then remove the two screws on both the left and right sides of the back of the tilt housing. Lift the tilt housing straight up to remove from the fryer.
6. Locate the red and white wires of the temperature probe to be replaced. Note where the leads are connected prior to removing them from the connector. Unplug the 12-pin connector C-6 and using a pin-pusher push the pins of the temperature probe out of the connector.
7. Raise the element and remove the securing probe bracket and metal tie wraps that secure the probe to the element (see illustration below).



8. Gently pull on the temperature probe and grommet, pulling the wires up the rear of the fryer and through the element tube assembly.
9. Insert the replacement temperature probe (wires first) into the tube assembly ensuring that the grommet is in place. Secure the probe to the elements using the bracket which was removed in Step 7 and the metal tie wraps which were included in the replacement kit.
10. Route the probe wires out of the tube assembly following the element wires down the back of the fryer through the Heyco bushings to the 12-pin connector C-6. Secure the wires to the sheathing with wire ties.
11. Insert the temperature probe leads into the 12-pin connector C-6 (see illustration below). For full-vat units or the right half of a dual-vat unit (as viewed from the rear of the fryer) the red lead goes into position 3 and the white lead into position 4 of the connector. For the left half of a dual-vat unit (as viewed from the rear of the fryer), the red lead goes into position 9 and the white lead into position 10. **NOTE:** ***Right*** and ***left*** refer to the fryer as viewed from the rear.



Probe Lead Positions

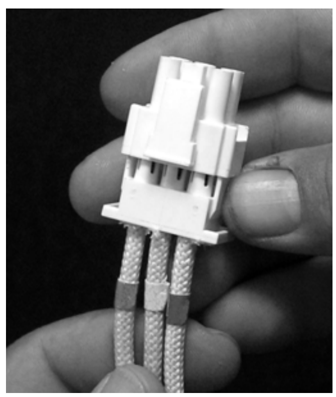
12. Secure any loose wires with wire ties, making sure there is no interference with the movement of the springs. Rotate the elements up and down, making sure that movement is not restricted and that the wires are not pinched.
13. Reinstall the tilt housing, back panels and contactor plug guards. Reposition the fryer under the exhaust hood and reconnect it to the electrical power supply to return the fryer to service.

1.6 Replacing a Heating Element

1. Perform steps 1-5 of section 1.5, *Replacing a Temperature Probe*.

2. Disconnect the wire harness containing the probe wiring, where the temperature probe is attached to the element being replaced. Using a pin pusher, disconnect the probe wires from the 12-pin connector.

3. In the rear of the fryer disconnect the 6-pin connector for the left element (as viewed from the front of the fryer) or the 9-pin connector for the right element from the contactor box. Press in on the tabs on each side of the connector while pulling outward on the free end to extend the connector and release the element leads (see photo below). Pull the leads out of the connector and out of the wire sleeving.

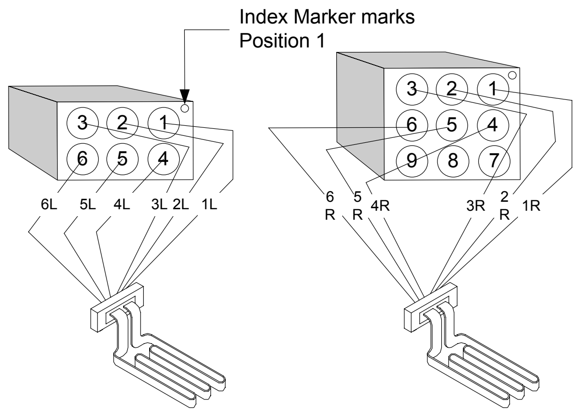


4. Raise the element to the full up position and support the elements.

5. Remove the hex head screws and nuts that secure the element to the tube assembly and pull the element out of the frypot. **NOTE:** Full-vat elements consist of two dual-vat elements clamped together. For full-vat units, remove the element clamps before removing the nuts and screws that secure the element to the tube assembly.

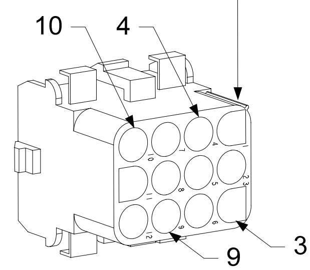
6. If applicable, recover the probe bracket and probe from the element being replaced and install them on the replacement element. Install the replacement element in the frypot, securing it with the nuts and screws removed in Step 5 to the tube assembly. Ensure the gasket is between the tube and element assembly.

7. Route the element leads through the element tube assembly and into the wire sleeving to prevent chafing. Ensure that the wire sleeving is routed back through the Heyco bushing, keeping it clear from the lift springs. Also ensure that the wire sleeving extends into the tube assembly to protect the edge of the tube assembly from chafing the wires. Press the pins into the connector in accordance with the diagram on the following page, and then close the connector to lock the leads in place. **NOTE:** It is critical that the wires be routed through the sleeving to prevent chafing.



8. Reconnect the element connector ensuring that the latches lock.

9. Insert the temperature probe leads into the 12-pin wiring harness connector (see illustration below). For full-vat units or the right half of a dual-vat unit, the red lead goes into position 3 and the white into position 4. For the left half of a dual-vat unit, the red lead goes into position 9 and the white into position 10. **NOTE:** ***Right*** and ***left*** refer to the fryer as viewed from the rear.



Probe Lead Positions

10. Reconnect the 12-pin connector of the wiring harness disconnected in Step 2.

11. Lower the element down onto the basket rack.

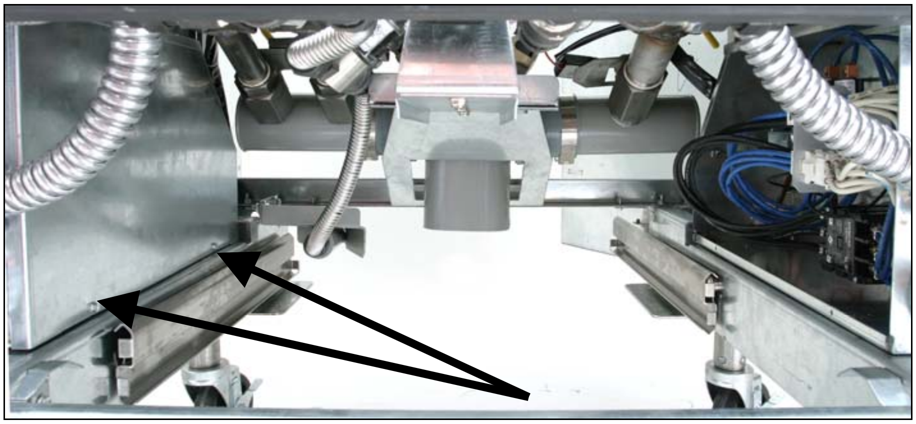
12. Reinstall the tilt housing, back panels and contactor plug guard. Reposition the fryer under the exhaust hood, and reconnect it to the electrical power supply.

1.7 Replacing Contactor Box Components

1. If replacing a contactor box component, remove the filter pan and lid from the unit.

2. Disconnect the fryer from the electrical power supply.

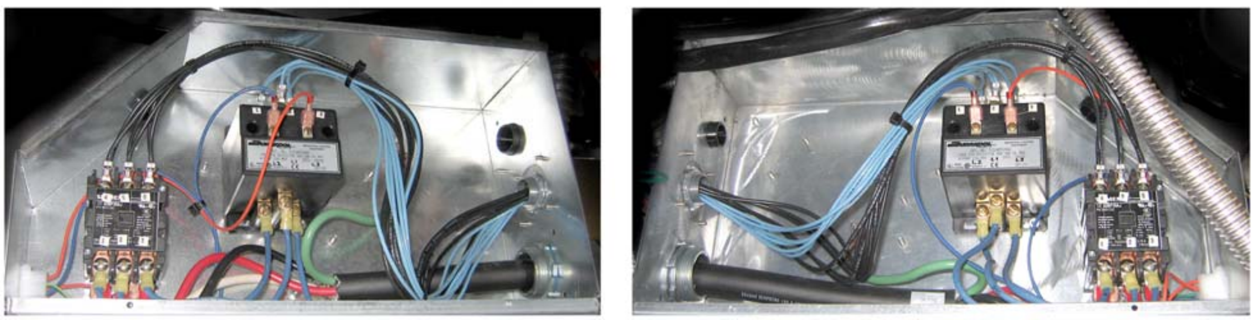
3. Remove the two screws securing the cover of the contactor box. The contactor boxes above the filter pan are accessed by sliding under the fryer. They are located to the left and right above the guide rails (see photo on the following page). The contactor boxes for frypots not over the filter pan are accessed by opening the fryer door directly under the affected frypot.



Remove two screws to access contactor box components above the filter pan.

4. The contactors and relays are held on by threaded pin studs so that only removal of the nut is required to replace the component.

5. After performing necessary service, reverse steps 1-4 to return the fryer to operation.



Left and right views of mechanical contactor box components.

1.8 Replacing a Frypot

1. Drain the frypot into the filter pan or, if replacing a frypot over the filter system, into a McDonald's Shortening Disposal Unit (MSDU) or other appropriate **METAL** container. If replacing a frypot over the filter system, remove the filter pan and lid from the unit.

⚠ DANGER
DO NOT drain more than one full frypot or two split frypots into the MSDU at one time.

2. Disconnect the fryer from the electrical power supply and reposition it to gain access to both the front and rear.

3. Slide the metal bezel up to release the bottom tabs, then slide the bezel down to disengage the upper tabs.

4. Remove the two screws from the upper corners of the control panels and allow them to swing down (see illustration and photo on page 1-1).

5. Unplug the wiring harnesses and ground wires from the backs of the controllers. Remove the controllers by lifting them from the hinge slots in the control panel frame.

6. Remove the screws from the bottom of the lower back panel attaching the contactor plug guards.

7. Remove each of the guards.

8. Remove the tilt housing and back panels from the fryer. The tilt housing must be removed first in order to remove the upper back panel.

9. To remove the tilt housing, remove the hex-head screws from the rear edge of the housing. The housing can be lifted straight up and off the fryer.

10. Remove the control panel by removing the screw in the center and the nuts on both sides.

11. Loosen the component boxes by removing the screws, which secure them in the cabinet.

12. Dismount the top cap by removing the nuts at each end that secure it to the cabinetry.

13. Remove the hex head screw that secures the front of the frypot to the cabinet cross brace.

14. Remove the top-connecting strip that covers the joint with the adjacent frypot.

15. Unscrew the nut located on the front of each section of drain tube, and remove the tube assembly from the fryer.

16. Remove the actuators from the drain and return valves and disconnect the wiring.

17. Disconnect any auto filtration probes and auto top off sensors and wiring.

18. At the rear of the fryer, unplug the 12-pin connector C-6 and, using a pin pusher, disconnect the high-limit thermostat leads.

19. Disconnect the oil return and top off flexline(s).

20. Raise the elements to the “up” position and disconnect the element springs.

21. Remove the machine screws and nuts that secure the element tube assembly to the frypot. Carefully lift the element assembly from the frypot and secure it to the cross brace on the rear of the fryer with wire ties or tape.

22. Carefully lift the frypot from the fryer and place it upside down on a stable work surface.

23. Recover the drain valve(s), oil return flexline connection fitting(s), actuators, AIF boards and high-limit thermostat(s) from the frypot. Clean the threads and apply Loctite™ PST 567 or equivalent sealant to the threads of the recovered parts and install them in the replacement frypot.

24. Carefully lower the replacement frypot into the fryer. Reinstall the hex head screw removed in step 9 to attach the frypot to the fryer.

25. Position the element tube assembly in the frypot and reinstall the machine screws and nuts removed in step 21.

26. Reconnect the oil return and auto top off flexlines to the frypot, and replace aluminum tape, if necessary, to secure heater strips to the flexlines.
27. Insert the high-limit thermostat leads disconnected in step 18 (see illustration on page 1-3 for pin positions).
28. Reconnect the actuators, ensuring the correct position of the drain and return valves.
29. Reconnect the auto filtration probes and auto top off sensors.
30. Reinstall the drain tube assembly.
31. Reinstall the top connecting strips, top cap, tilt housing back panels and contactor plug guards.
32. Reinstall controllers in the control panel frame and reconnect the wiring harnesses and ground wires.
33. Reposition the fryer under the exhaust hood and reconnect it to the electrical power supply.

1.9 Built-in Filtration System Service Procedures

1.9.1 Filtration System Problem Resolution

One of the most common causes of filtration problems is placing the filter pad/paper on the bottom of the filter pan rather than over the filter screen.

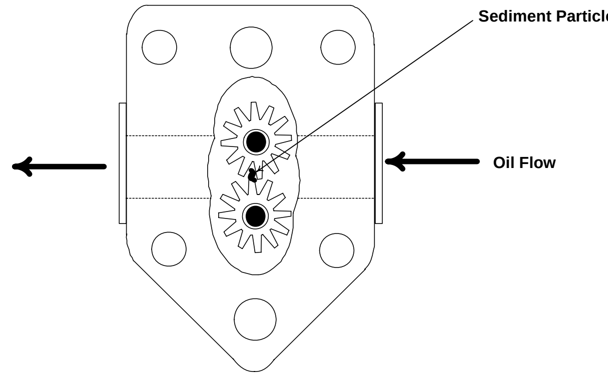
⚠ CAUTION
Ensure that filter screen is in place prior to filter pad/paper placement and filter pump operation. Improper screen placement is the primary cause of filtration system malfunction.

Whenever the complaint is "the pump is running, but no oil is being filtered," check the installation of the filter pad/paper, and ensure that the correct size is being used. While you are checking the filter pad/paper, verify that the O-rings on the pick-up tube of the filter pan are in good condition. A missing or worn O-ring allows the pump to take in air and decrease its efficiency.

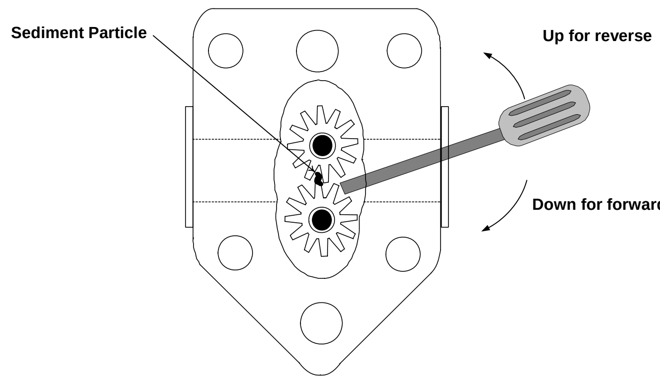
If the pump motor overheats, the thermal overload will trip and the motor will not start until it is reset. If the pump motor does not start, press the red reset switch (button) located on the rear of the motor.

If the pump starts after resetting the thermal overload switch, then something is causing the motor to overheat. A major cause of overheating is when several frypots are filtered sequentially, overheating the pump and motor. Allow the pump motor to cool at least 30 minutes before resuming operation. Pump overheating can be caused by:

- Solidified shortening in the pan or filter lines, or
- Attempting to filter unheated oil or shortening (cold oil is more viscous, overloading the pump motor and causing it to overheat).



If the motor runs but the pump does not return oil, there is a blockage in the pump. Incorrectly sized or installed paper/pads will allow food particles and sediment to pass through the filter pan and into the pump. When sediment enters the pump, the gears bind, causing the motor to overload, again tripping the thermal overload. Shortening that has solidified in the pump will also cause it to seize, with the same result.



A pump seized by debris or hard shortening can usually be freed by manually moving the gears with a screwdriver or other instrument.

Disconnect power to the filter system, remove the input plumbing from the pump, and use a screwdriver to manually turn the gears.

- Turning the pump gears in reverse will release a hard particle.
- Turning the pump gears forward will push softer objects and solid shortening through the pump and allow free movement of the gears.

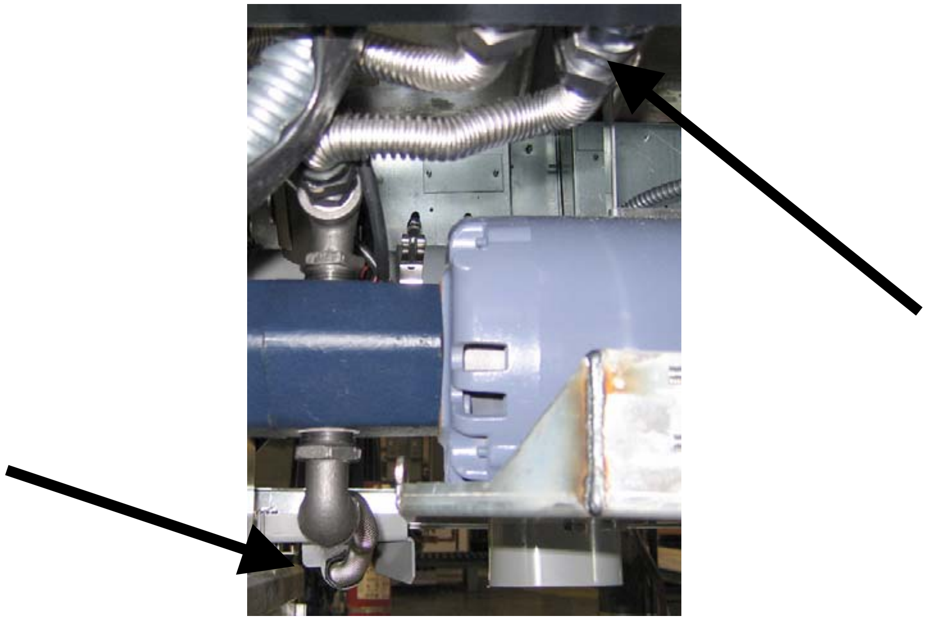
Incorrectly sized or installed paper/pads will also allow food particles and sediment to pass through and clog the suction tube on the bottom of the filter pan. Particles large enough to block the suction tube may indicate that the crumb tray is not being used. Pan blockage can also occur if shortening is left in the pan and allowed to solidify. Blockage removal can be accomplished by forcing the item out with an auger or drain snake. Compressed air or other pressurized gases should not be used to force out the blockage.

1.9.2 Replacing the Filter Motor, Filter Pump, and Related Components

1. Remove the filter pan and lid from the unit. Drain the frypots into a McDonald’s Shortening Disposal Unit (MSDU) or other appropriate metal container.

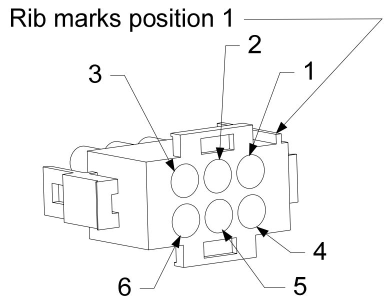
⚠ DANGER
<u>DO NOT</u> drain more than one full frypot or two split frypots into the MSDU at one time.

2. Disconnect the fryer from the electrical power supply and reposition it to gain access to both the front and rear.
3. Disconnect the flexline running to the oil-return manifold at the rear of the fryer as well as the pump suction flexline at the end of the filter pan connection (see photo on the following page).



Disconnect flexlines indicated by the arrows.

4. Loosen the nut and bolt which secure the bridge to the oil-return manifold.
5. Remove the cover plate from the front of the motor and disconnect the motor wires.
6. Unplug the pump motor assembly 6-pin connector C-2 and, using a pin pusher, disconnect the vent vacuum-breaker solenoid (pins 2 and 5) that is attached to the oil return manifold.
7. Remove the two nuts and bolts which secure the front of the bridge to the cross brace and carefully slide the bridge rearward off the cross brace until its front end can be lowered to the floor. Undo the single nut holding it in place in back. Be careful not to let the rear of the bridge slip off the manifold at this point.
8. Get a good grip on the bridge, carefully pull it forward off the oil-return manifold, and lower the entire assembly to the floor. Once on the floor, pull the assembly out the front of the fryer.
9. When required service has been completed, reverse steps 6-12 to reinstall the bridge. **NOTE:** The black motor wires go on the top terminal, the white on the bottom. The red/black heater tape wires go into position 3 and the violet/white wires go into position 6 (see illustration below).



Oil Return Solenoid, Vent Solenoid
and Heater Lead Positions

10. Reconnect the unit to the electrical power supply, and verify that the pump is functioning correctly using the MIB board in manual mode (i.e., using the fill function when engaged, the motor should start and there should be strong suction at the intake fitting and outflow at the rear flush port.)

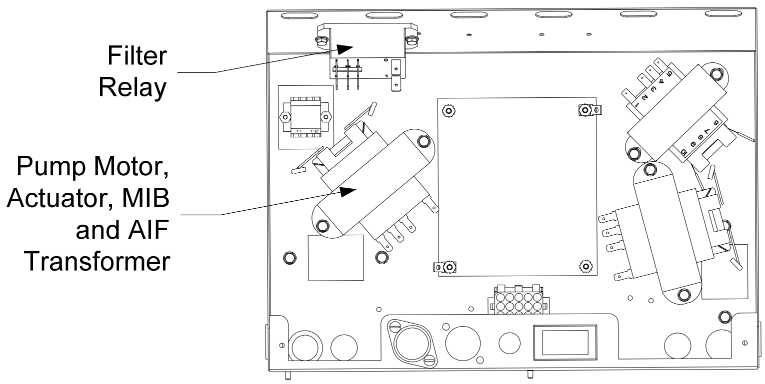
11. When proper operation has been verified, reinstall the back panels and the filter pan and lid.

12. Reposition the fryer under the exhaust hood and reconnect it to the electrical power supply to return the fryer to service.

1.9.3 Replacing the Transformer or Filter Relay

Disconnect the fryer from the electrical power supply. Remove the left controller from the fryer to expose the interior of the left component box. The transformer and relay on the left are located as shown in the illustration below. **NOTE:** The right component box is identical to the left except that the transformer and relay on the left side are not present. Once replaced, reconnect the power.

When replacing a filter relay in the left component box, ensure the 24VDC relay (8074482) is used. Similar Frymaster fryers use a 24VAC relay, which can lead to confusion. The 24VDC is used in the LOV™ fryer.



1.10 ATO (Automatic Top-off) Service Procedures

The automatic top-off system is activated when the oil level falls below a sensor in the rear of the frypot. The signal is sent to the ATO board to engage the solenoid to the frypot and turn on the ATO pump. The pump draws oil from the JIB (Jug In Box) to a port in the rear of the frypot. Once the oil level has satisfied the sensor, the pump and solenoid turn off.

The ATO board is located inside the box, behind the JIB (see Figure 1). The power for the ATO board is supplied from the right hand component box. The power passes through the transformer inside the ATO box to the board.

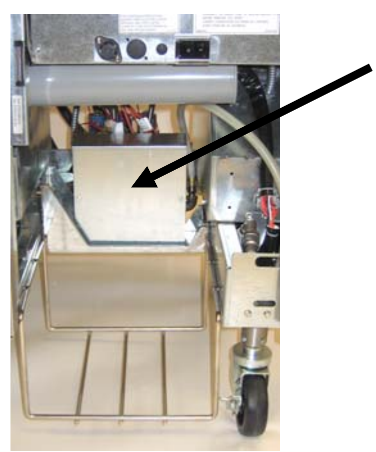


Figure 1

1.10.1 ATO (Automatic Top-off) Troubleshooting

Problem	Probable Causes	Corrective Action
Frypots won't top off.	A. Probe temperature lower than setpoint. B. Oil is too cold. C. ATO board power loss D. Failed solenoid. E. ATO pump failed or over tightened. F. Failed transformer/harness. G. Failed ATO board.	A. Check to see that fryer is heating. Fryer temperature must be at setpoint. Check probe resistance. If probe is bad, replace the probe. B. Ensure that the oil in the JIB is above 70°F (21°C). C. Power to the ATO board has been cut off. Restore power to the board and cycle **ALL** computers off and on to readdress system. D. Check solenoid to see if functioning properly. E. If the solenoid is working, ensure that the screws on the bottom of the pump are not too tight. Loosen the screws. If loosening the screws doesn't fix the problem, replace the pump. F. Ensure transformer in ATO box is functioning properly. Check power from transformer to ATO board. Ensure all harnesses are plugged securely into place. G. Check for proper voltages using the pin position chart found on page 1-14. If ATO found defective, replace ATO board.
The yellow JIB low light won't illuminate.	A. Power in the component box is not present. B. Failed transformer. C. Loose wire connection	A. Ensure power is present in the component box. B. If power is present in component box, check the transformer for correct voltage. C. Ensure the yellow LED is securely attached to plug J6 on the ATO board.
One vat tops off but other vats fail to top off.	A. Failed solenoid B. Loose wire connection.	A. Check power to the pump. A hot pump suggests a failed solenoid. B. Ensure all wiring harnesses are securely connected to ATO board and solenoids.
Incorrect vat tops off.	A. Wired incorrectly. B. Flexlines connected to wrong vat.	A. Check wiring. B. Switch flexlines to correct vat.
Frypot tops off cold.	Incorrect setpoint	Ensure setpoint is correct.

1.10.2 ATO (Automatic Top-Off) Board Pin Positions and Harnesses

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J8	Solenoids	8074572 x1 (FV) 8074572 x2 (DV)	1	Output DV - Vat #1	Ground	Orange
			2	Output FV - Vat #1		
			3	Output DV - Vat #2		
			4	Output FV - Vat #2		
			5	Output DV - Vat #3		
			6	Output FV - Vat #3		
	Top Off Pump & JIB Reset Switch	8074671	7	Top Off Pump	16VDC	Red
			8	JIB Low Reset		Black
	Solenoids	8074572 x1 (FV) 8074572 x2 (DV)	9	24VAC DV - Vat #1	24VAC	Orange
			10	24VAC FV - Vat #1		
			11	24VAC DV - Vat #2		
			12	24VAC FV - Vat #2		
			13	24VAC DV - Vat #3		
			14	24VAC FV - Vat #3		
	Top Off Pump & JIB Reset Switch	8074671	15		16VDC	
			16	Ground		Red
J4 (Rear) / J5 (Front)	Transformer	8074553	1	24VAC Ret	24VAC	Orange
			2	24VAC		Blue
			3			
			4			
			5	12VAC Ret	12VAC	Red
			6	12VAC		Brown
			7			
			8			
J3 - Vat #3 J2 - Vat #2 J1 - Vat #1	ATO RTD	8074655 - Vat #1 8074654 - Vat #2 8074621 - Vat #3	1	DV - Probe Ground	Ohm	White
			2	DV - Probe		Red
			3	FV - Probe Ground		White
			4	FV - Probe		Red
J6	Orange LED	8074555	1	16VDC	16VDC	Black
			2	16VDC Ret		Red
J7			1			
			2			
			3	Ground		
			4	RB7/DATA		
			5	RB6/CLOCK		
J10	Network Resistor (pins 2 & 3) or to next ATO Board (4 & 5 vat units)	8074552	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J9	AIF J5	8074546	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White

1.10.3 Replacing the ATO board or Transformer

Disconnect the fryer from the electrical power supply. Locate the ATO box (see Figure 1 on page 12), behind the JIB (Jug In Box). Remove the cover to expose the transformer and ATO board (see Figure 2). Mark and unplug any wires or harnesses. Replace the defective component and reattach all wires or harnesses. Replace the cover. Once replaced, reconnect the power. Remove and restore power to ALL computers after power has been restored to the ATO board.



Figure 2

1.10.4 Replacing the ATO Pump or Solenoid

Disconnect the fryer from the electrical power supply. Locate the ATO pump and solenoid tree (see Figure 3), behind the ATO box. Mark and unplug any wires or harnesses. Replace the defective component and reattach all wires or harnesses. Once replaced, reconnect the power.



Figure 3

1.11 MIB (Manual Interface Board) Service Procedures

The MIB (Manual Interface Board) oversees and controls filtration. It receives and sends data over the CAN (Controller Area Network) to and from various sensors and computers. It activates the filtration cycle, controlling when actuators should open and close.

The MIB controller is located inside the left cabinet (see Figure 4). In normal operation a cover hides the MIB controls and the LED display is visible. The cover is held in place with three torx screws. In normal operation, an "A" is displayed for automatic mode. The MIB control board is useful for diagnostic purposes. It allows manual operation of both the actuators and filter pump without using the M2007 computer.

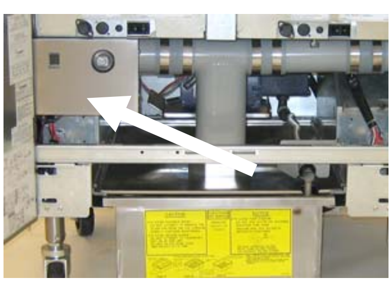


Figure 4: MIB controller cover.



Figure 5

Buttons and LED's

Manual – This button is used to toggle between auto and manual filtration mode. A corresponding LED is lit when in Manual mode. When pressed, a message will be sent to all vats, indicating the mode has changed.

The following buttons are inoperable in auto mode:

Select - This button is used to scroll through available vats, choosing one to be manually filtered.

Drain – This button is used to open and close the drain on the vat indicated on the display. It's embedded LED indicates activity:
Slow blink: Awaiting response from the AIF board.
Constant Illumination: Drain open.
No Illumination: Drain closed.
Rapid Blink: No response from the AIF board.

Return – This button is used to open and close the return valve on the vat indicated on the display. It also turns on and off the pump. It's embedded LED indicates activity:
Slow blink: Awaiting response from the AIF board.
Constant Illumination: Return valve open.
No Illumination: Return valve closed.
Rapid Blink: No response from the AIF board.

The pump is turned off first before closing the return valve or the valve will open first before turning on the pump.

1.11.1 Manually Draining, Refilling or Filtering using the MIB board

Press the manual/auto switch to set to manual. The LED on the manual key will illuminate and a vat number is displayed (see Figure 6).

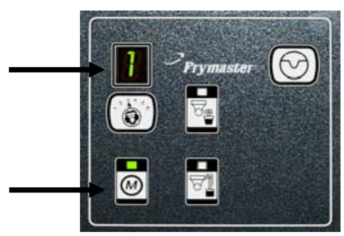


Figure 6

Press the vat selector switch to change vats (see Figure 7).



Figure 7

Pressing the drain or return switch illuminates and activates the drain or return valve for the vat indicated. Pressing both allows filtration (see Figure 8).

Pressing the manual/auto switch will return to automatic mode.



Figure 8

1.11.2 MIB (Manual Interface Board) Troubleshooting

Problem	Probable Causes	Corrective Action
Auto filtration won't start.	A. Filter pan out of position. B. Ensure MIB board is not in manual mode. C. Ensure MIB cover is not damaged and pressing against buttons. D. Filter relay has failed. E. AIF is set to enabled, blue light doesn't light.	A. Ensure filter pan is fully inserted into fryer. B. Ensure MIB board is in "A" automatic mode. Press the reset button. C. Remove and replace cover and see if filtration will start. D. Replace filter relay with part number 807-4482 24VDC relay. E. Set AIF in Level 1 to disabled.
MIB display shows something other than an "A" or vat number.	An error has occurred and displayed character indicates error.	See MIB display diagnostics on page 1-20 for explanation.
No power present at the MIB board	Transformer has failed in left component box.	Check output on the left transformer in left component box; should read 24VAC. If not replace transformer.
MIB error will not clear.	Power surge or other electrical problem.	Press the reset switch, top right corner of the MIB board, to reinitialize the CAN system. The reset takes about 20 seconds per vat. The MIB display should return to "A", though it may take more than one minute to do so.
MIB indicates incorrect number of vats.	A. Network is not terminated correctly. B. Wiring harnesses are loose or damaged. C. Locator pin issue.	A. Ensure the CAN bus system is terminated at **BOTH ENDS** (on the M2007 connector J6 and on the ATO board connector J9) with a resistor equipped 6-pin connector. In early units, it is possible that the resistor could short. Disconnect power to the unit, unwrap the resistor leads, and ensure they are not touching. B. Unplug and reseat all wiring harnesses in CAN system. Check resistance between pins 2 and 3 on the CAN network connectors. If checking with resistor at the end reading should be 120 ohms. C. The locator pin in J2 of the AIF board is either loose or in the incorrect position. See the charts on page 1-51 of this manual for proper pin position.
MIB displays "U".	Battery is not configured.	Readdress system by entering 2007 in tech mode. See "Readdress LOV configuration" on page 1-32.

Problem	Probable Causes	Corrective Action
MIB board alternating “N” and “r”.	Network error on the CAN bus communication.	A. Ensure the CAN bus system is terminated at **BOTH ENDS** (on the M2007 connector J6 and on the ATO board connector J10) with a resistor equipped 6-pin connector. B. Ensure all 6-pin CAN connectors are tight between the M2007 (J6 and J7), MIB (J1 and J2), AIF (J4 and J5) and ATO (J10) boards. C. Check continuity between each color wire on the CAN connectors into J7 on the far right computer and J10 on back of the ATO board (black to black, white to white, and red to red), and ensure there is no continuity between different color wires (black to red, red to white, and white to black). D. Ensure black computer locator wires are connected from ground to correct pin position (see drawing 8051734 page 1-51). E. Ensure all boards have the corner ground wire attached and tightened. F. The locator pin in J2 of the AIF board is either loose or in the incorrect position. See the charts on page 1-51 of this manual for proper pin position. G. In early units, it is possible that the resistor could short. Disconnect power to the unit, unwrap the resistor leads, and ensure they are not touching.

1.11.3 MIB (Manual Interface Board) Pin Positions and Harnesses

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	**M2007 J7**	**8074546**	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			

J2	**AIF J4**	**8074547**	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J3	**SD Card**					
J4	**RTI - JIB Fill Switch**		1	Momentary Switch - Out	5VDC	Red
			2	Momentary Switch - In	5VDC	Black
	Reset Switch		3	Ground		Red
			4	Reset		Green
J5	**Transformer**	**8074649**	1	24VAC	24VAC	Black
			2	24VAC Ret		White
	Filter Relay		3	Pump Motor	24VDC	Red
			4	Pump Motor		Green
	Blue LED		5	Blue LED +	24VDC	Black
			6	Blue LED -		White
			7			
			8			
			9			
			10			
	Pan Switch		11	Pan Sw +	24VDC	Black
			12	Pan Sw -		Red
			13	Ground		
			14	Ground		
			15			
			16			
J6	**RTI - Pump & Solenoids**		1	From RTI transformer	24VAC	Black
			2	Common		White
			3	To RTI "Add Pump" Relay	24VAC	Green
			4	To Waste Solenoid - 3 Way	24VAC	Brown
			5			
			6	To Fill Solenoid - 3 Way	24VAC	Black
			7	Ground - Fill Solenoid		Black
			8	From RTI "Waste Tank Full Sensor" Test Pins 1 to 8	24VAC – Full 0VAC – Not Full	Red
J7	**From RTI Box**		1	From RTI transformer	24VAC	Black
			2	Common		White
			3	To RTI “Add Pump” Relay	24VAC	Green
			4	To Waste Solenoid - 3 Way	24VAC	Brown
			5			
			6	RTI JIB Valve Fill Solenoid	24VAC	Black
			7	Ground - Fill Solenoid		Black
			8	From RTI "Waste Tank Full Sensor" Test Pins 1 to 8	24VAC – Full 0VAC – Not Full	Red

1.11.4 MIB (Manual Interface Board) Display Diagnostics

DISPLAY	LED	EXPLANATION
Drain		
Vat #	On	Drain valve on vat # is open
Vat #	Off	Drain valve on vat # is closed
Vat #	Slow blink	Drain valve on vat # is opening or closing
Vat # alternating with O	Fast blink	Problem opening drain valve on vat#
Vat # alternating with C	Fast blink	Problem closing drain valve on vat#
Vat # alternating with d	Fast blink	Problem with drain on vat#. (i.e. possible plugged drain)
Return		
Vat #	On	Return valve on vat # is open
Vat #	Off	Return valve on vat # is closed
Vat #	Slow blink	Return valve on vat # is opening or closing
Vat # alternating with O	Fast blink	Problem opening return valve on vat #
Vat # alternating with C	Fast blink	Problem closing return valve on vat #
Network		
Vat # alternating with n	Drain LED fast blink	Network timeout waiting for response. Could be on drain opening or on drain closing.
Vat # alternating with n	Return LED fast blink	Network timeout waiting for response. Could be on return opening or on return closing.
An “r” alternating with an “n”		Network timeout waiting for a response on a reset command.
An “F” alternating with an “n”		Network timeout waiting for a success or failure message during auto filtering.
Initial State, Configuring the system, and resetting		
U		The state of the battery is unknown. The manual board is waiting for an INIT_CONFIG message from a cooking computer. Once the message is received the manual board will start the process of determining which fryers have split or full vats.
L		An L will be displayed while the manual board is contacting the cooking computers for the initial configuration of the system.
An “r”		An “r” is displayed to indicate that the system is in the process of resetting a vat.
Miscellaneous		
Vat # alternating with an “E”		The actuator circuit has an issue. Check that the actuator is plugged in.
Vat # alternating with an “R”		The vat is trying to close the corresponding drain and return valves.
A	Manual LED off	The system is in auto filtration mode.
Fast blinking Vat #	LED fast blinking There will also be a fast blinking LED corresponding to the problem valve.	The system can not go into auto filtration mode because there is a problem closing a valve on one of the vats.
Vat #	Manual LED on	The system is in manual mode.
P		This will only be displayed in auto filtration mode. Filter pan is improperly seated. Any auto filtration messages received at this time are ignored.

MIB (Manual Interface Board) Display Characters

A – Auto Mode – Auto Filtration enabled.

C – Closed Valve - The display will alternate between **C** and the corresponding vat number and the valve LED is blinking.

d – Drain Issue- The display will alternate between **d** and the corresponding vat number. This indicates the drain valve has a problem. i.e. The drain is clogged.

E – Actuator circuit is not sensing the actuator. The display will alternate between **E** and the corresponding vat number. Ensure the actuator is plugged in.

F – An "**F**" alternating with an "**n**" appears when the MIB doesn't receive a complete filtration response from the AIF board.

L – Loading - Loading the vat configuration from the cooking computers. The MIB has been in an unknown state (i.e. Initial startup) and is reloading information. This is not displayed often.

n – Network Error - An "**n**" displayed alternating with another character indicates a network error. An "**r**" alternating with an "**n**" indicates a network timeout on a reset. An "**F**" alternating with an "**n**" appears if the manual board never receives a complete filtration response from the AIF board. If a vat number is alternating with an "**n**" and either the drain or the return LED is blinking, indicating there was a timeout error opening or closing the drain.

O – Open Valve - The display will alternate between **O** and the corresponding vat number and the corresponding valve LED is blinking.

P – Pan Switch – Filter pan is improperly seated. Filtration is suspended.

r – Reset Switch - Reset the vat closes all of the valves on the vat. If displayed for some time, there is probably a problem with the board.

U – The battery is not configured. The manual board must receive a message from a cooking computer telling it to initialize the battery. Readdress the system using the M2007 code in tech mode. See page 1-32.

1 – 8 – Numbers which correspond to the vats. These numbers are displayed in manual mode.

1.11.5 MIB (Manual Interface Board) Auto Filtration Failure Scenarios

Failure	Display	Solution
Cannot open drain valve.	Vat # alternating with **O**, fast blinking drain LED.	Check drain valve.
Cannot close drain valve	Vat # alternating with **C**, fast blinking drain LED.	Check drain valve.
No message from the cooking computer, indicating that the oil has drained out.	Vat # alternating with **d**, fast blinking drain LED.	Close drain valve.
Cannot open return valve	Vat # alternating with **O**, fast blinking return LED.	Check return valve.
Cannot close return valve	Vat # alternating with **C**, fast blinking return LED.	Check return valve.
Actuator is not plugged in.	Vat # alternating with **E**.	Plug in actuator.
Manual board doesn't get a response from the AIF board.	"**N**" is displayed.	Check network cable from MIB plug J2 to AIF plug J4.

1.11.6 Replacing the MIB Board

Disconnect the fryer from the electrical power supply. Remove the torx screws from the MIB cover, exposing the MIB board (see Figure 9). Removing the four nuts in the corners disconnects the MIB board. Carefully remove the plugs on the rear of the board (see Figure 10). Replace with a new MIB board and reverse steps to reassemble. Once replaced, reconnect the power.

The board will need to be readdressed. Press and hold on the M2007 buttons ◀ and ▶ simultaneously for **TEN** seconds until CODE appears. Enter 2007. The MIB display will display L followed by vat numbers alternating with **"r"**. When the readdress is finished, the MIB board will display A. This step must be done when the MIB board is replaced. The readdress procedure can be performed from any one M2007 computer in the bank.



Figure 9



Figure 10

1.12 RTI Service Issues

1.12.1 RTI MIB Tests

The LOV™ fryer will ONLY operate with RTI systems that have the new RTI updated three-pole float switch. If the float switch is the older two-pole switch, call RTI. These float switches are polarity specific which may short to ground and damage an MIB board.

Normal measurements (MIB J6 8 pin connector with everything connected)

AC voltage measurements:

Pin 1 to Pin 2 - 24 VAC.
Pin 1 to Pin 8 - 24 VAC when waste tank is full, 0 VAC when it is not full.
Pin 2 to Pin 3 - 24 VAC when RTI add switch and pump is on, 0 VAC when it is off.
Pin 2 to Pin 4 - 24 VAC when RTI waste valve switch is on, 0 VAC when it is off.
Pin 6 to Pin 7 - 24 VAC when RTI JIB valve is on, 0 VAC when it is off.

Troubleshooting

All return and drain valves should be closed and pump should be off while the MIB is resetting roughly five seconds or so after a power on or after pressing the reset button; if any of the valves or pumps are on during reset then the MIB board is bad or wires are shorted.

If JIB valve is not opening:

Take these readings when the JIB valve in the open position:

1. Voltage at MIB board from Pin 1 to Pin 2 should be 24 VAC; if not, check connections from RTI 24VAC transformer and check transformer.
2. Voltage at MIB board from Pin 6 to Pin 7, should be 24 VAC; if not, the MIB board is bad or wires to JIB valve are shorted or both.
3. Voltage at JIB valve should be 24 VAC; if not then check wiring from MIB board.

If Waste valve is not opening:

Take these readings when the waste valve in the open position:

1. Voltage at MIB board from Pin 1 to Pin 2 should be 24 VAC; if not, check connections from RTI 24VAC transformer and check transformer.
2. Voltage at MIB board from Pin 2 to Pin 4, should be 24 VAC; if not, the MIB board is bad or wires to Waste valve are shorted or both.
3. Voltage at Waste valve should be 24 VAC; if not, check wiring from MIB board.

If Add pump is not operating:

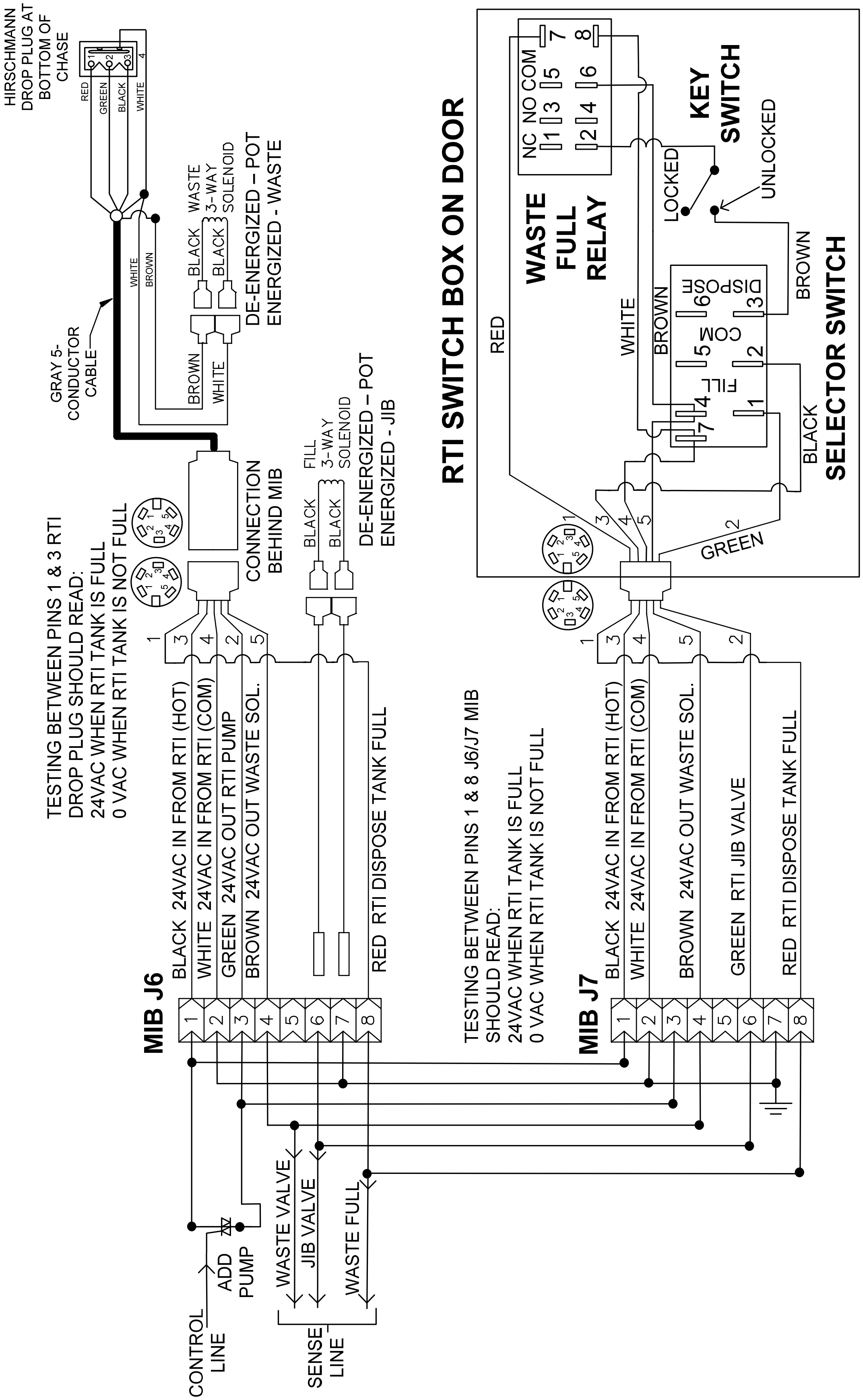
Take these readings with the add pump switch on:

1. Voltage at MIB board from Pin 1 to Pin 2, should be 24 VAC; if not, check connections from RTI 24VAC transformer and check transformer.
2. Voltage at MIB board from Pin 2 to Pin 3, should be 24 VAC; if not, the MIB board is bad or wires to pump relay are shorted or both.
3. Voltage at Add pump relay should be 24 VAC; if not, check wiring from MIB board. The relay is located on top of RTI system.

Waste full signal:

Pin 1 to Pin 8 should be 24 VAC when full, 0 VAC when not full; if no level change, the connection from RTI switch or MIB board is bad.

1.12.2 RTI LOV™ Wiring with RTI Switchbox



1.12.3 RTI LOV™ TEST QUICK REFERENCE

DISPOSE TO WASTE, REFILL POT FROM BULK:

1. Hold down “filter” button until computer beeps twice.
2. Scroll down to “dispose” using “Info" button then press “✓” button.
3. Press “✓” to dispose of oil in pot.
4. “Vat Empty” is displayed.
5. Press “✓” if it is empty or press “×” if vat still contains oil.
6. “Clean Vat Complete” is displayed.
7. Press “✓”.
8. “Engage Dispose Switch” is displayed. Switch the RTI switch to dispose*.
9. Press the “✓” to start disposal. “Pan to Waste” displayed.
10. “Pan Empty” is displayed.
11. Press “✓” if oil in filter pan is empty. Select “×” if pan still has oil in it.
12. “Disengage Dispose Switch” is displayed. Switch off the RTI dispose switch.
13. Press “✓” when RTI dispose switch is off.
14. “Fill Pot From Bulk” is displayed.
15. Press “✓” if you wish to fill pot.
16. Hold down “✓” to fill pot to desired level.
17. Press “×” to Exit program.

* NOTE: If the waste tank is full, the computer displays “RTI Tank Full.” Call RTI.

DISPOSE TO WASTE:

1. Hold down “filter” button until computer beeps twice.
2. Scroll down to “dispose” using “Info” button and press “✓” button.
3. Press “✓”.
4. “Vat Empty” is displayed.
5. Press “✓” if it is empty or press “×”) if vat still contains oil.
6. “Clean Vat” is displayed.
7. Press “✓”.
8. “Engage Dispose Switch” is displayed. Switch key to unlock and press the RTI switch to dispose.
9. Press “✓”. “Pan to Waste” displayed.
10. “Pan Empty” is displayed.
11. Press “✓” if oil in filter pan is empty. Select “×” if pan still has oil in it.
12. “Disengage Dispose Switch” is displayed. Switch off the RTI dispose switch.
13. “Fill Pot from Bulk” is displayed.
14. Press “×” if you wish to leave pot empty and exit program.

FILL POT FROM BULK:

1. Hold down “filter” button until computer beeps twice.
2. Press the ▼ to scroll to “Fill Pot From Bulk”
3. Press “✓”.
4. Hold down “✓” to fill pot to desired level.
5. Press “×” to Exit program.

FILL JUG FROM BULK:

1. When “Orange” indicator light is on, the pot top-off jug is empty.
2. To refill jug press **ADD** button on the RTI box located on the interior of the of jug access door.
3. Hold down button until oil is to desired level in jug.
4. Press the JIB reset button above the jug to turn the yellow LED off and reengage the ATO system.

JUG AND VAT WON’T FILL:

1. Enter FLTR MENU by pressing and holding the FLTR button.
2. Scroll to FILL POT FROM BULK. Press 1.
3. Computer displays FILL POT FROM BULK/ YES NO. Press 1.
4. When the actuator opens, press 1 briefly again. Press 2.
5. Try to fill pot or JIB to see if issue is resolved. If not, contact RTI.

1.13 AIF (Automatic Intermittent) Filtration Service Procedures

The AIF (Automatic Intermittent Filtration) board controls the actuators that open and close the drain and return valve. The AIF boards are located inside a protective housing under each frypot (see Figure 11).

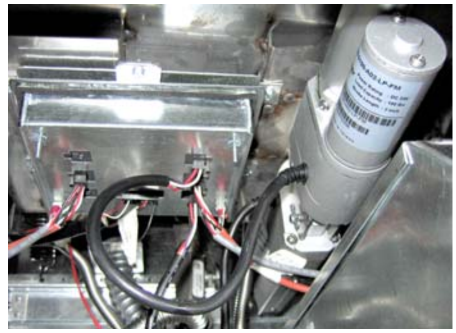


Figure 11

1.13.1 AIF Troubleshooting

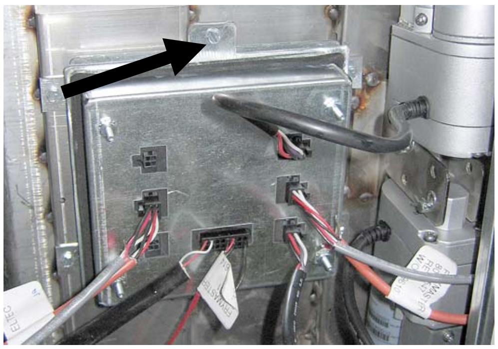
Problem	Probable Causes	Corrective Action
Actuator doesn't function.	A. No power to the AIF board. B. Actuator is unplugged. C. AIF board failure. D. Actuator is bad.	A. Check pins 5 and 6 of J2 at the MIB board. Should read 24VDC. Check voltage on pins 5 and 6 at the other end of harness and ensure 24VDC is present. Continue to check pins 5 and 6 for 24VDC on plugs J4 and J5 on the AIF boards. B. Ensure the actuator is plugged into the proper connection (J1 for FV return, J3 for DV return and J6 for FV drain and J7 for DV drain). C. Check power on the connector of the problem actuator while trying to manually open or close an actuator. Pins 1 (Black) and 4 (White) should read +24VDC when the actuator is opening. Pins 2 (Red) and 4 (White) should measure -24VDC when the actuator is closing). If either voltage is missing, the AIF board is likely bad. Test the actuator by plugging into another connector. If the actuator operates, replace the board. D. If proper voltages are present at the connector and actuator doesn't operate, replace the actuator.
Actuator functions on wrong vat.	A. Actuator plugged into wrong connector. B. Locator pin is in wrong position.	A. Ensure the actuator is plugged into correct connection (J1 for FV return, J3 for DV return and J6 for FV drain and J7 for DV drain). B. Ensure the locator pin is in proper position in plug J2. See table B on page 1-51.

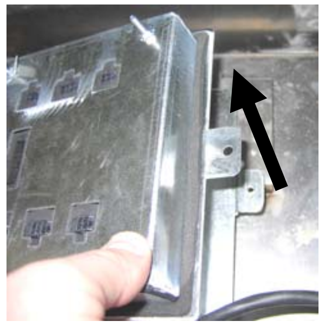
1.13.2 AIF (Auto Intermittent Filtration) Actuator Board Pin Positions and Harnesses

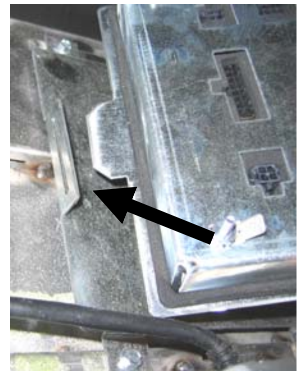
Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color
J1	FV Return	N/A	1	Ret + (Open)	24VDC	Black
			2	Ret – (Closed)	24VDC	Red
			3	Ret Position		Purple
			4	Ground		White
J2	FV AIF RTD	8074551 (FV) 8074550 (DV)	1	Ground		White
			2	FV - Temp		Red
	DV AIF RTD		3	Ground		White
			4	DV - Temp		Red
			5			
			6			
			7			
			8			
	Pressure Switch (Gas)		9	DV – Press Sw (Gas)		
			10	FV – Press Sw (Gas)		
	Locator Pin		11	Locator Vat #5		Black
			12	Locator Vat #4		
			13	Locator Vat #3		
			14	Locator Vat #2		
			15	Locator Vat #1		
	Locator		16	Locator Signal		Black
J3	DV Return	N/A	1	Ret + (Open)	24VDC	Black
			2	Ret – (Closed)	24VDC	Red
			3	Ret Position		Purple
			4	Ground		White
J4	MIB J2 or AIF J5	8074547 AIF Board Communication and Power	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J5	AIF J4 or ATO J10	8074547 AIF Board Communication and Power	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J6	FV Drain	N/A	1	Drain + (Open)	24VDC	Black
			2	Drain – (Closed)	24VDC	Red
			3	Drain Position		Purple
			4	Ground		White
J7	DV Drain	N/A	1	Drain + (Open)	24VDC	Black
			2	Drain – (Closed)	24VDC	Red
			3	Drain Position		Purple
			4	Ground		White

1.13.3 Replacing an AIF (Automatic Intermittent Filtration) board

Disconnect the fryer from the electrical power supply. Locate the AIF board to be replaced under a frypot. Mark and unplug the harnesses. The AIF board assembly is held in place with one screw in the front of the assembly (see Figure 12). Remove the screw and the front of the assembly drops down (see Figure 13) and the back tab slides out of the bracket attached to the frypot (see Figure 14). Reverse steps to reassemble, ensuring that the new AIF assembly slides into the slot in the rear of the bracket.


Figure 12


Figure 13


Figure 14

1.13.4 Replacing an Actuator

Disconnect the fryer from the electrical power supply. Locate the actuator to be replaced under a frypot and mark and unplug the actuator. The actuators are held in place by two clevis pins which are held in by cotter ring pins (see Figure 15). Remove both clevis pins and remove the actuator. Attach the new actuator with only the rear clevis pin and cotter ring pin (see Figure 16). Rotate the actuator shaft until the holes of the shaft and valve plate align. Insert the second clevis pin and cotter ring pin to secure.

Ensure the replacement return valve is positioned correctly by filtering a vat of oil on a vat other than the vat with the new valve. If bubbles appear in the vat with the new valve, further adjustment of the actuator or valve is necessary. Take out the pins and adjust the valve until no bubbles are present in the vat. Reinsert the pins to secure the actuator.

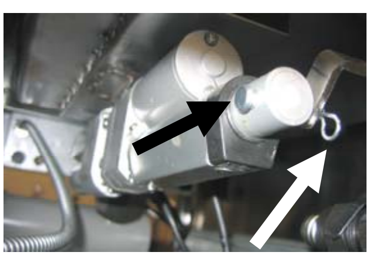

Figure 15


Figure 16

1.14 M2007 Computer Service Procedures

1.14.1 M2007 Computer Troubleshooting

Problem	Probable Causes	Corrective Action
No Display on Computer.	A. Computer not turned on.	A. Press the ON/OFF switch to turn the computer on.
	B. No power to the fryer.	B. This fryer has two cords: a computer power cord and a main power cord. If the computer cord is not plugged in, the computer will not activate. Verify computer power cord is plugged in and that circuit breaker is not tripped.
	C. Computer has failed.	C. Swap the computer with a computer known to be good. If computer functions, replace the computer.
	D. Damaged computer wiring harness.	D. Swap with a harness known to be good. If computer functions, replace the harness.
	E. Power supply component or interface board has failed.	E. If any component in the power supply system (including the transformer and interface board) fail, power will not be supplied to the computer and it will not function.
Computer locks up.	Computer error.	Remove and restore power to the computer.
M2007 display shows FILTER BUSY.	A. Another filtration cycle is still in process. B. Computer error. C. Computer error.	A. Wait until the previous filtration cycle ends to start another filtration cycle. B. A computer has an error. Using the filter menu, try to perform a FILL POT FROM DRAIN PAN on each vat (see section 4.11.3 page 4-22 of the BIELA14 IO manual). Only computers with errors can perform this function with a filter busy error. Computer should clear and return to normal operation once complete. C. If filter busy is still displayed with no activity, ensure the filter pan is empty and remove and restore **ALL** power to the fryer.
Heat indicator off upon initial startup. Display shows HI or HOT with alarm sounding.	Failed computer.	Replace computer.
M2007 display is in wrong temperature scale (Fahrenheit or Celsius).	Incorrect display option programmed.	See section 1.14.2 on page 1-32 to change temperature scale.

Problem	Probable Causes	Corrective Action
M2007 displays CHANGE FILTER PAD.	Filter error has occurred, filter pad clogged, 24 hour filter pad change prompt has occurred or change filter pad was ignored on a prior prompt.	Change the filter pad and ensure the filter pan has been removed from the fryer for a minimum of **TWO** minutes, then press ✓ (1 YES) following any additional instruction prompts displayed on the computer. Do **NOT** ignore CHANGE FILTER PAD prompts.
M2007 display shows CHK PAN.	A. Filter pan is not fully inserted into fryer. B. Missing filter pan magnet. C. Defective filter pan switch.	A. Pull filter pan out and fully reinsert into fryer. B. Ensure the filter pan magnet is in place and if missing replace. C. If the filter pan magnet is fully against the switch and computer continues to display CHK PAN, switch is possibly defective.
M2007 display shows HOT-HI-1.	Frypot temperature is more than 410ºF (210ºC) or, in CE countries, 395ºF (202ºC).	This in an indication of a malfunction in the temperature control circuitry, including a failure of the high-limit thermostat.
M2007 display shows HI-LIMIT.	Computer in high-limit test mode.	This is displayed only during a test of the high-limit circuit and indicates that the high-limit has opened properly.
M2007 display shows LOW TEMP.	Frypot temperature is between 180°F (82°C) and 315°F (157°C).	This display is normal when the fryer is first turned on while in the melt cycle mode. To bypass the melt cycle press and hold a #2 product button under the LCD display until a chirp is heard. The alarm will chirp and the computer displays EXIT MELT alternating with YES NO. Press the #1 YES button to exit melt. It may appear for a short while if a large batch of frozen product is added to the frypot. If the display never goes out, the fryer is not heating.
M2007 display shows ERROR RM SDCRD	Defective SD Card	Replace card with another card.
M2007 display shows PROBE FAILURE.	Problem with the temperature measuring circuitry including the probe.	This indicates a problem within the temperature measuring circuitry. Check resistance of probe, if faulty replace probe.
M2007 display shows PROBE FAILURE **with alarm sounding.**	Damaged computer wiring harness or connector.	Swap the computer wiring harness with one known to be good. If problem is corrected replace the harness.
M2007 display shows IGNITION FAILURE.	Failed computer, failed interface board, open high-limit thermostat.	Is displayed if the fryer loses its ability to heat oil. It is also displayed when the oil temperature is above 450°F (232°C) and the high-limit thermostat has opened, halting the heating of the oil.

Problem	Probable Causes	Corrective Action
Computer will not go into program mode or some buttons do not actuate.	Failed computer.	Replace computer
M2007 display shows HI 2 BAD.	Computer in high-limit test mode.	This is displayed only during a test of the high-limit circuit and indicates that the high-limit has failed.
M2007 display shows IGNITION FAILURE **and alarm sounds, but fryer operates normally (false alarm).**	Failed computer.	Replace computer.
M2007 display shows software for only M2007 or MIB but not all boards.	Loose or damaged harness	Check that all harnesses between M2007's, MIB, AIF and ATO are secure. Ensure 24VDC is present on pins 5 & 6 of J2 on MIB board and on J4 or J5 of AIF board. Check for loose or broken pins/wires. If the problem persists, swap out computer from one bank to another and reinitialize.
M2007 display shows LOW TEMP**, heating indicator cycles on and off normally but fryer does not heat.**	A. Power switch off. B. Failed computer. C. Damaged computer wiring harness. D. Open connection in high-limit circuit.	A. Turn on switch next to fuse, then turn the computer off and then on again. B. Replace computer. C. Replace computer wiring harness. D. Check high limit circuit starting at the control box connector working to the high-limit.
M2007 display shows FILTER ERROR.	A filter error has occurred due to dirty or clogged filter pad or paper, clogged filter pump, filter pump thermal overload, improperly installed filter pan components, worn or missing O-rings, cold oil or an actuator problem.	Follow the steps in the flowchart in section 1.14.4.
Fryer filters after each cook cycle.	Filter after setting incorrect or software update issue.	Overwrite the filter after setting by re-entering the filter after value in level two. Ensure that the down arrow is pressed after entering the value to save the setting (see section 4.13.5 on page 4-36 in the BIELA14 IO Manual).
MAINT FILTER **(Manual Filter) won't start.**	Temperature too low.	Ensure fryer is at setpoint before starting MAINT FILTER.

1.14.2 M2007 Useful Codes

To enter any of the following codes: Press and hold ◄ and ► simultaneously for **TEN** seconds and a three chirps sound. Release the buttons and CODE appears.

- **Reset Factory Menu** - Enter 3322. The computer display flashes and quickly counts from 1-40 and switches to OFF. (**NOTE**: This will delete any hand-entered menu items).
- **Switch between Domestic Menu and International Menu** - Enter 1212.
- **Reset** CALL TECH **Message** - Disconnect board locator plug (J10). Reinsert plug. Enter 1000. Computer display switches to OFF. Remove and then restore power to the computer using the 20-pin plug. If this message appears at any time other than after upgrade from version 47, replace the computer.
- **Reset** BADCRC **Message** - Disconnect board locator plug (J10). Reinsert plug. Enter 9988. Computer display switches to OFF. Remove and then restore power to the computer using the 20-pin plug.
- **Change from F° to C°** - Enter 1658. The computer displays OFF. Turn the computer on and check temperature to see the temperature scale. If the desired scale is not displayed, repeat.
- **Enter Tech Mode – Enter 1650.**
- **Readdress LOV™ configuration after changing an MIB board – Enter 2007.**
- **Reset** RECOVERY FAULT CALL SERVICE **– Enter 0042.**

PASSWORDS

To enter level one, level two passwords: Press and hold the **TEMP** and **INFO** buttons simultaneously until level 1 or level 2 is displayed. Release the buttons and ENTER CODE appears.

- **Fryer Setup, Level One and Level Two** – Enter 1234.
- **Usage Password** – Enter 4321 (resets usage statistics).

1.14.3 Tech Mode

Tech mode allows technicians to reset all passwords set in levels one and two, and reset the time and date. It also allows the technician to access the fryer main setup mode.

1. Press and hold ◄ and ► simultaneously for **TEN** seconds until three chirps sound and CODE is displayed.
2. Enter 1650.
3. The computer displays TECH MODE and changes to CLEAR PASSWORDS.
4. Press the ✓ (**1**) button to accept selection and clear the passwords.
5. The computer displays CLEAR PASSWORDS on the left and COMPLETE on the right. This clears any passwords set up under levels one and two.
6. Press the ▼ button to toggle to CLEAR SIGNATURE.
7. Press the ✓ (**1**) button to accept the change.
8. The computer displays CLEAR SIGNATURE on the left and COMPLETE on the right. Resets to a default date and time
9. Press the ▼ button to toggle to FILTER PAD TIME on the left and 24 on the right. (24 hours is the default time to change the pad)
10. Press the ✘ (**2**) button to accept changes and exit.
11. The computer displays OFF.

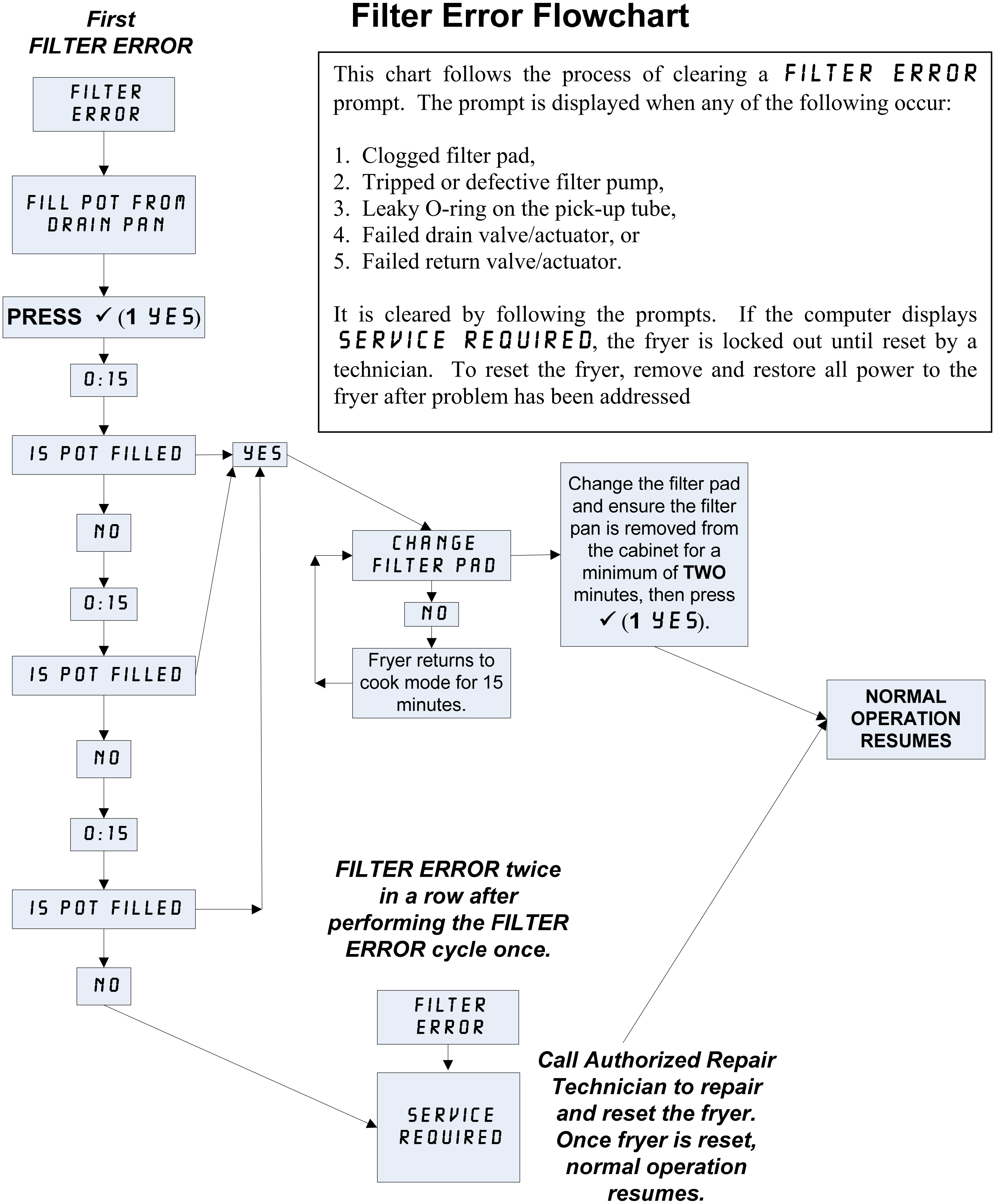
1.14.4 M2007 Filter Error Flowchart

Filter Error Flowchart

This chart follows the process of clearing a FILTER ERROR prompt. The prompt is displayed when any of the following occur:

1. Clogged filter pad,
2. Tripped or defective filter pump,
3. Leaky O-ring on the pick-up tube,
4. Failed drain valve/actuator, or
5. Failed return valve/actuator.

It is cleared by following the prompts. If the computer displays SERVICE REQUIRED, the fryer is locked out until reset by a technician. To reset the fryer, remove and restore all power to the fryer after problem has been addressed



1.14.5 M2007 Menu Summary Tree

Reflected below are the major programming sections in the M2007 and the order in which submenu headings will be found under the sections in the Installation and Operation Manual.

Adding New Menu Items See section 4.10.2
Storing Menu Items in Product Buttons See section 4.10.3
Draining, Refilling, and Disposing of Oil See section 4.10.4

M2007 Menu Items	Location in IO Manual

- Filter Menu 4.11
  [Press and hold ◄ FLTR or FLTR ►]
  - Auto Filter
  - Maint Filter
  - Dispose
  - Drain to Pan
  - Fill Pot from Drain Pan
  - Fill Pot from Bulk

- Programming
  - Level 1 Program 4.12
    [Press and hold **TEMP** and **INFO** buttons, 2 beeps, displays **Level 1**, enter 1234]
    - Product Selection 4.12.1
      - Name
      - Cook Time
      - Temp
      - Cook ID
      - Duty Time 1
      - Duty Time 2
      - Qual Tmr
      - AIF Disable
      - Assign Btn
    - AIF Clock 4.12.2
      - Disabled
      - Enabled
    - Deep Clean Mode 4.12.3
    - High-Limit Test 4.12.4
      - High-Limit Test 1
      - High-Limit Test 2
    - Fryer Setup 4.9
  - Level 2 Program (Manager Level) 4.13
    [Press and hold **TEMP** and **INFO** buttons, 3 beeps, displays **Level 2**, enter 1234]
    - Prod Comp Sensitivity for product 4.13.1
    - E-Log Log of last 10 error codes 4.13.2
    - Passwords Change passwords 4.13.3
      - Setup [enter 1234]
      - Usage [enter 4321]
      - Level 1 [enter 1234]
      - Level 2 [enter 1234]
    - Alert Tone Volume and Tone 4.13.4
      - Volume 1-9
      - Tone 1-3
    - Filter After Sets number of cooks before filter prompt 4.13.5
    - Filter Time Sets amount of time between filter cycles 4.13.6
  - Tech Mode
    [Press and hold ◄ and ► for 10 seconds, 3 beeps, displays CODE, enter 16501
    - Clear Passwords
    - Clear Signatures
    - Filter Pad Time

- Info Mode 4.14
  [Press and hold **INFO** for 3 seconds, displays INFO MODE]
  - Full/Split Vat Configuration
    - Filter Stats 4.14.1
    - Review Usage 4.14.2
    - Last Load 4.14.3

1.14.6 M2007 Board Pin Positions and Harnesses

Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color
J2	**Interface Board to Computer**	**8074199 SMT Computer to Interface Board Harness**	1	12VAC In	12VAC	Black
			2	Ground		
			3	12VAC In	12VAC	
			4	FV Heat Demand		
			5	V Relay	12VDC	
			6	DV Heat Demand		
			7	R/H B/L	12VDC	
			8	Analog Ground		
			9	L/H B/L	12VDC	
			10	ALARM		
			11	Sound Device	5VDC	
			12	ALARM		
			13	FV Probe		
			14	Common Probes		
			15	DV Probe		
			16			
			17			
			18			
			19			
			20			
J6	**Next M2007 J7 or Network Resistor**	**8074546 Computer Communication Harness**	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			
J7	**MIB J1 or previous M2007 J6**	**8074546 Computer Communication Harness**	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			
J9	**ONLY USED ON NON-AIF UNITS**					
J10	**Interface Board Ground to Computer**	**8074573 Computer Locator Harness**	1	Vat #1		Black
			2	Vat #2		
			3	Vat #3		
			4	Vat #4		
			5	Vat #5		
			6			
J11	**SD Card**					

1.15 Loading and Updating Software Procedures

1.15.1 Loading Software from an SD card to MIB and AIF boards

The software can be updated on the AIF, MIB, M2007 and ATO. Follow the following instructions to update. If updating **ALL** the software update the MIB/AIF and then the M2007/ATO. and then remove **ALL** power from the fryer by removing and restoring **ALL** power cords on the rear of the unit.

To update MIB or AIF software follow these steps:

1. Switch all computers to OFF. Press the TEMP button to check current M2007/MIB/AIF/ATO software version.
2. Remove the two screws on the right side cover plate of the MIB board.
3. With the MIB displaying " A" insert the SD card. With the contacts facing out and the notch on the bottom left, into the slot on the right side of the MIB board (see Figures 17 and 18).
4. A period will blink on the bottom right of the MIB display, indicating the software is being downloaded. If a period does not appear, it will not update. If this happens, contact Frymaster.
5. Leave the SD card in place for a minimum of two minutes and the blinking period stops.
6. Remove the SD card from the MIB.
7. If updating all software on the fryer, stop here and continue to the next page to load the M2007 and ATO software. If updating only the MIB or AIF software continue to step 8.
8. Remove power from the MIB by carefully removing the 16-pin harness behind the MIB board or the five-pin control power cord on the rear of the unit.
9. Restore power to the MIB to reboot the system.
10. A successful upgrade is confirmed by a "**cLc**" display on the MIB board upon restart followed by "**r, 1, r, 1, r, 2, r,** etc ending with A". If this does not happen, reload the software.
11. Verify software upgrade by pressing the **TEMP** button with the computer OFF to check the updated MIB/AIF version.



Figure 17

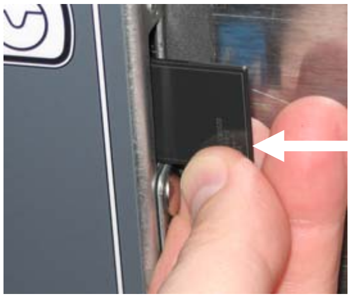


Figure 18

1.15.2 Loading Software from an SD card to an M2007 Computer or ATO Board

To update M2007 and ATO software, follow these steps:

1. Switch all computers to OFF. Press the TEMP button to check current M2007/MIB/AIF/ATO software version.
2. Remove the two screws on the left side cover plate of the M2007 board.
3. With the computer folded down and the MIB displaying A, insert the SD card, with the contacts facing down and the notch on the bottom right (see Figure 19 and 20), into the slot on the left side of the M2007.
4. Once inserted, FWUPD appears on the left display and SCCRCOK on the right. Numbers count up on the right display.
5. The display then changes to FWLOAD on the left; numbers count up on the right.
6. The computer displays OBFCRC. If updating ATO software at this time, the computer will display FWU ATO on the left and will count down from 2500 on the right.
7. When the update is complete the M2007 displays DONE on the left and RM SDCRD on the right.
8. Remove the SD card using the fingernail slot on the top of the SD card.
9. Repeat steps 1-8 for all computers.
10. If updating only the M2007 and/or ATO software continue to the next step. If updating **ALL** the software on the fryer skip to item 12
11. Remove and restore power to the M2007's by carefully removing the 20-pin J2 plug on the rear of **ALL** the computers. There is short delay prior to the computer powering up and displaying OFF.
12. If updating **ALL** the software update the MIB/AIF then the M2007/ATO, and then remove **ALL** power from the fryer by removing and restoring **ALL** power cords on the rear of the unit. There is short delay prior to the computer powering up and displaying OFF.
13. With the computer displaying OFF, verify software update by pressing the **TEMP** button to check updated M2007/MIB/AIF/ATO version.
14. The software update may change passwords. Enter level two mode and verify correct passwords.



Figure 19

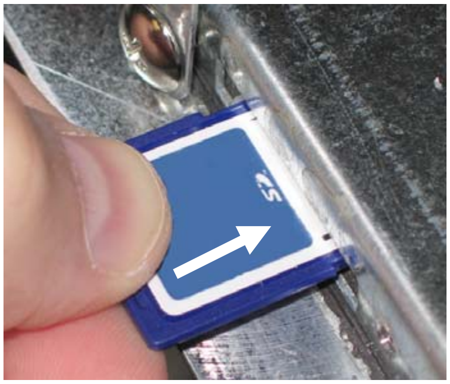
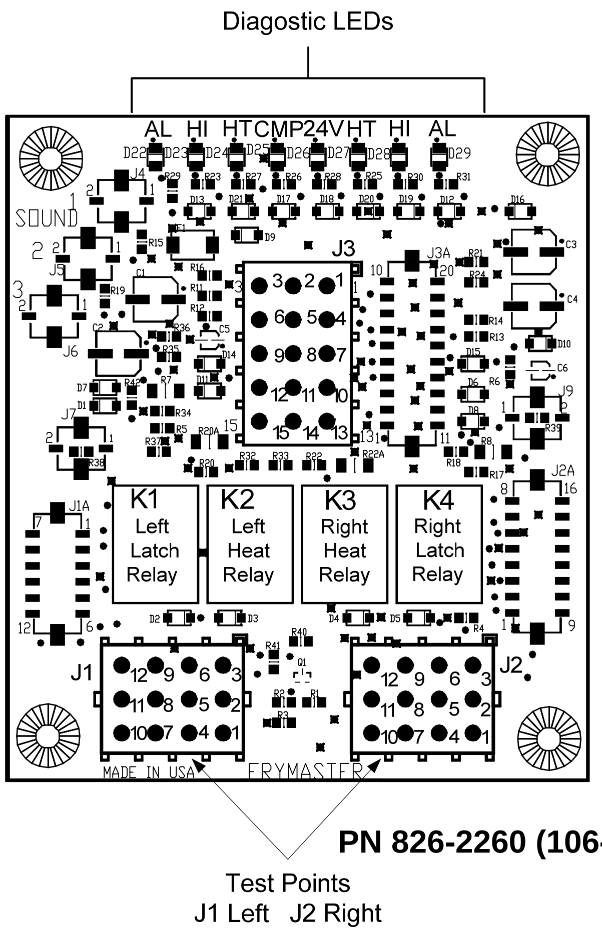


Figure 20

1.16 Interface Board Diagnostic Chart

The following diagram and charts provide ten quick system checks that can be performed using only a multimeter.



PN 826-2260 (106-6664)

Diagnostic LED Legend

CMP	**indicates power from 12V transformer**
24	**indicates power from 24V transformer**
HI	**(RH) indicates output (closed) from right latch relay**
HI	**(LH) indicates output (closed) from left latch relay**
HT	**(RH) indicates output from right heat relay**
HT	**(LH) indicates output from left heat relay**
AL	**(RH) indicates output (open) from right latch relay**
AL	**(LH) indicates output (open) from left latch relay**

NOTE – **Pin 1 is located in the bottom right corner of Both J1 and J2. These test points are ONLY for LOV™ Series boards with J1 and J2 plugs on the front of the board.**

Meter Setting	Test	Pin	Pin	Results
12 VAC Power	50 VAC Scale	3 of J2	1 of J2	12-16 VAC
24 VAC Power	50 VAC Scale	2 of J2	Chassis	24-30 VAC
*Probe Resistance (RH)	R X 1000 OHMS	11 of J2	10 of J2	See Chart
*Probe Resistance (LH)	R X 1000 OHMS	1 of J1	2 of J1	See Chart
High-Limit Continuity (RH)	R X 1 OHMS	9 of J2	6 of J2	0 - OHMS
High-Limit Continuity (LH)	R X 1 OHMS	6 of J1	9 of J1	0 - OHMS
Latch Contactor Coil (RH)	R X 1 OHMS	8 of J2	Chassis	3-10 OHMS
Latch Contactor Coil (LH)	R X 1 OHMS	5 of J1	Chassis	3-10 OHMS
Heat Contactor Coil (RH)	R X 1 OHMS	7 of J2	Chassis	11-15 OHMS
Heat Contactor Coil (LH)	R X 1 OHMS	4 of J1	Chassis	11-15 OHMS

*** Disconnect 15-Pin harness from the computer/controller before testing the probe circuit.**

1.17 Probe Resistance Chart

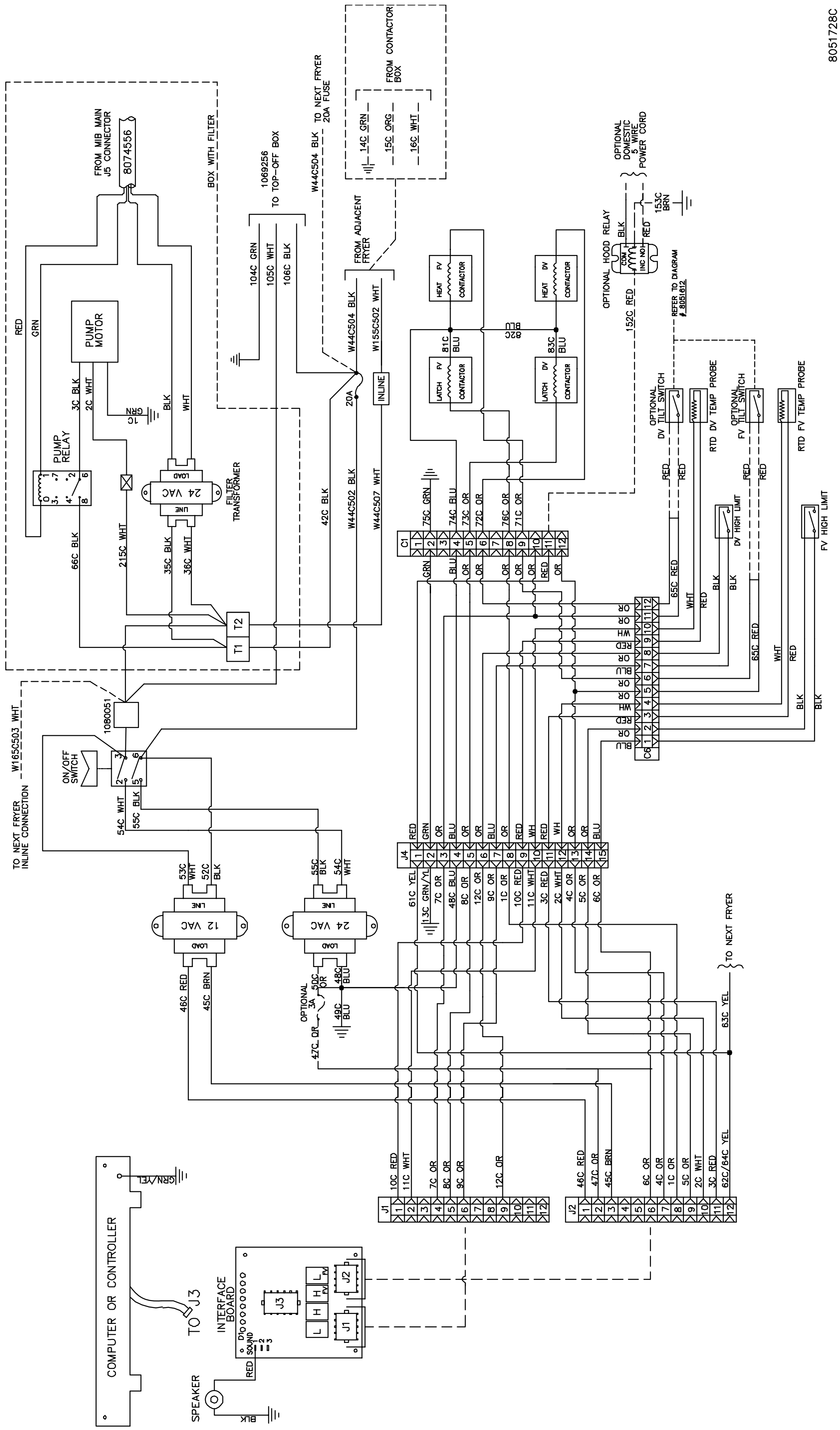
Probe Resistance Chart

For use with fryers manufactured with Minco Thermistor probes only.

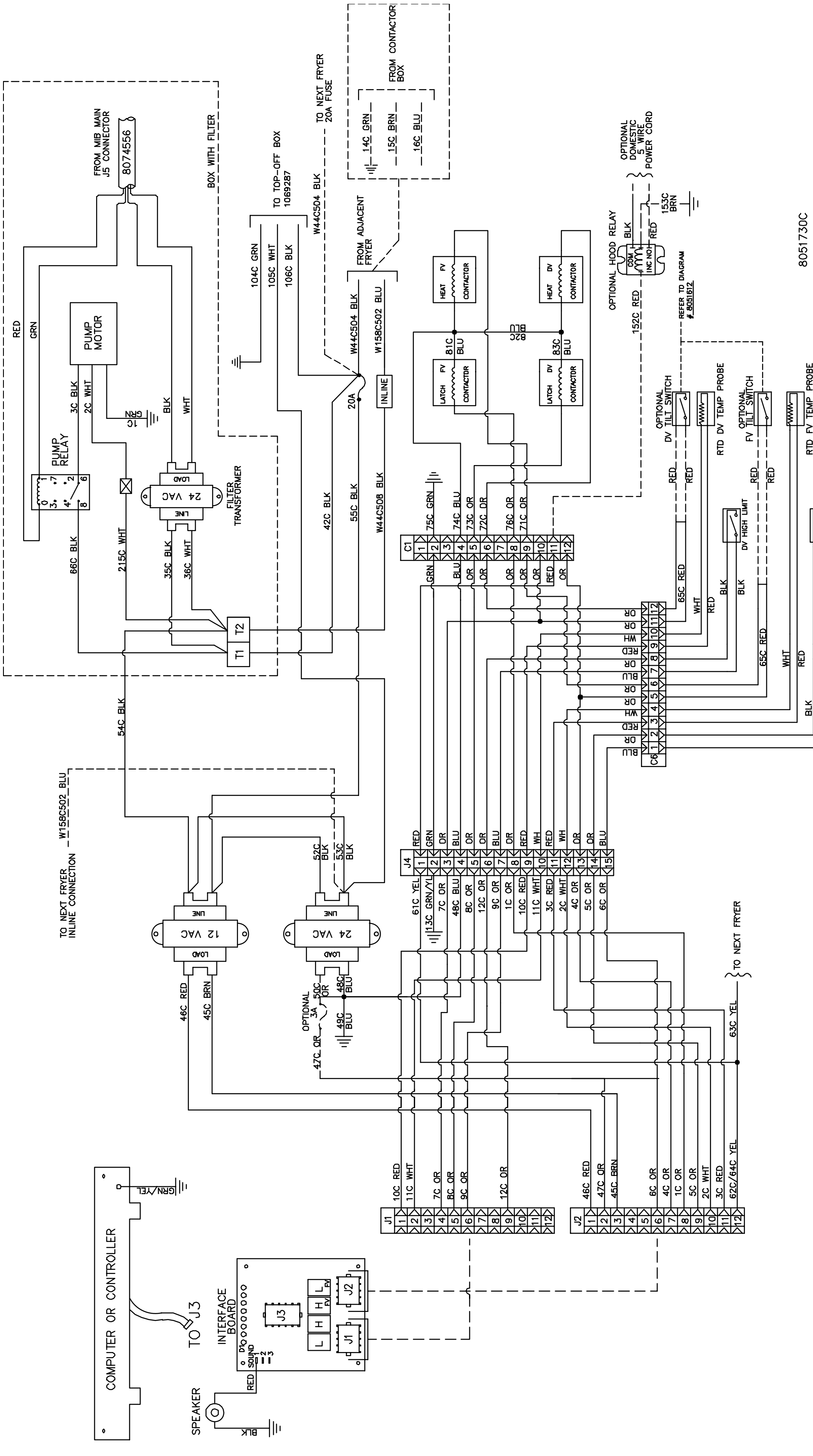
F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C
60	1059	16	130	1204	54	200	1350	93	270	1493	132	340	1634	171
65	1070	18	135	1216	57	205	1361	96	275	1503	135	345	1644	174
70	1080	21	140	1226	60	210	1371	99	280	1514	138	350	1654	177
75	1091	24	145	1237	63	215	1381	102	285	1524	141	355	1664	179
80	1101	27	150	1247	66	220	1391	104	290	1534	143	360	1674	182
85	1112	29	155	1258	68	225	1402	107	295	1544	146	365	1684	185
90	1122	32	160	1268	71	230	1412	110	300	1554	149	370	1694	188
95	1133	35	165	1278	74	235	1422	113	305	1564	152	375	1704	191
100	1143	38	170	1289	77	240	1432	116	310	1574	154	380	1714	193
105	1154	41	175	1299	79	245	1442	118	315	1584	157	385	1724	196
110	1164	43	180	1309	82	250	1453	121	320	1594	160	390	1734	199
115	1174	46	185	1320	85	255	1463	124	325	1604	163	395	1744	202
120	1185	49	190	1330	88	260	1473	127	330	1614	166	400	1754	204
125	1195	52	195	1340	91	265	1483	129	335	1624	168	405	1764	207

1.18 Wiring Diagrams

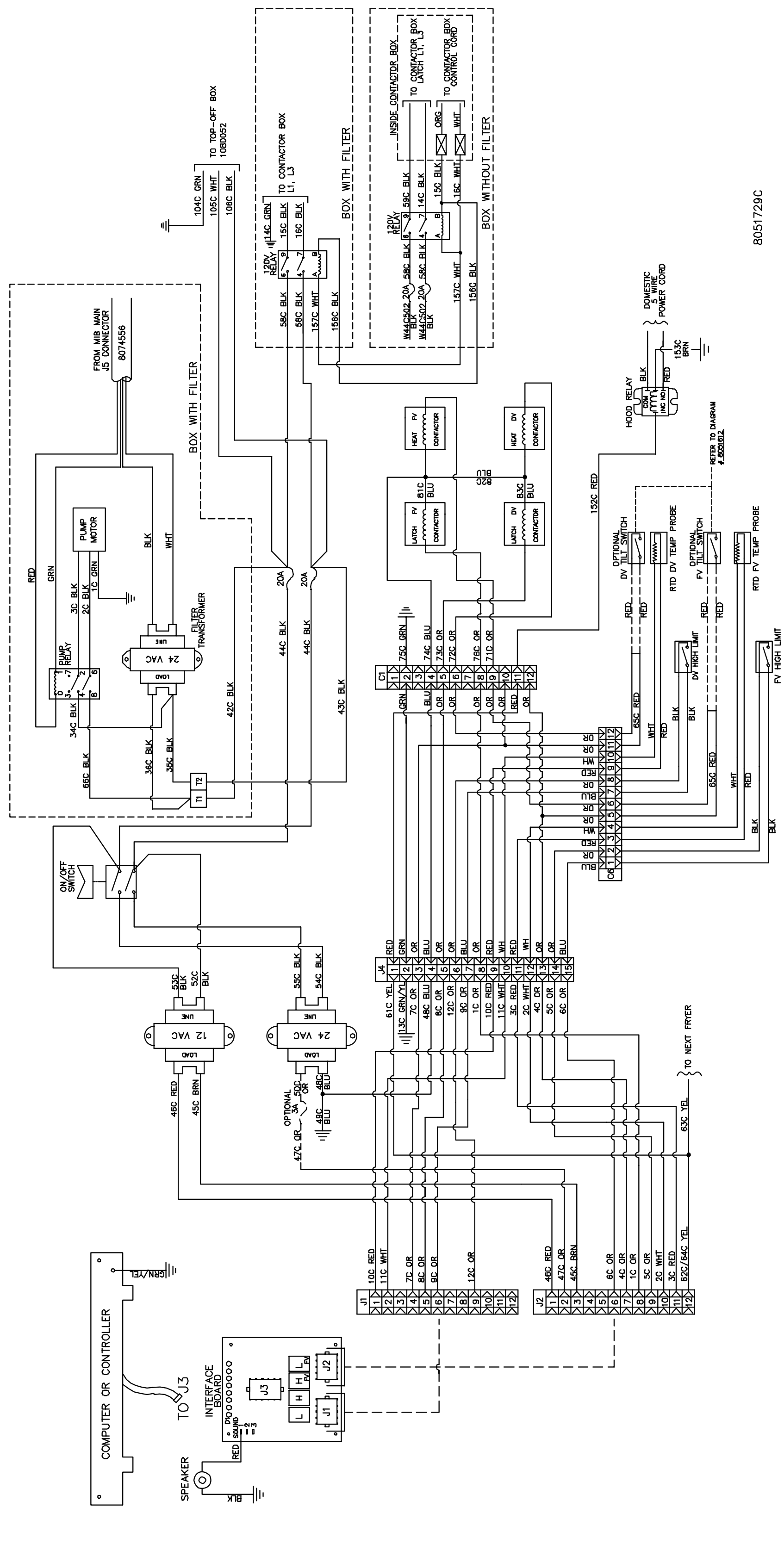
1.18.1 Component Wiring (Domestic)



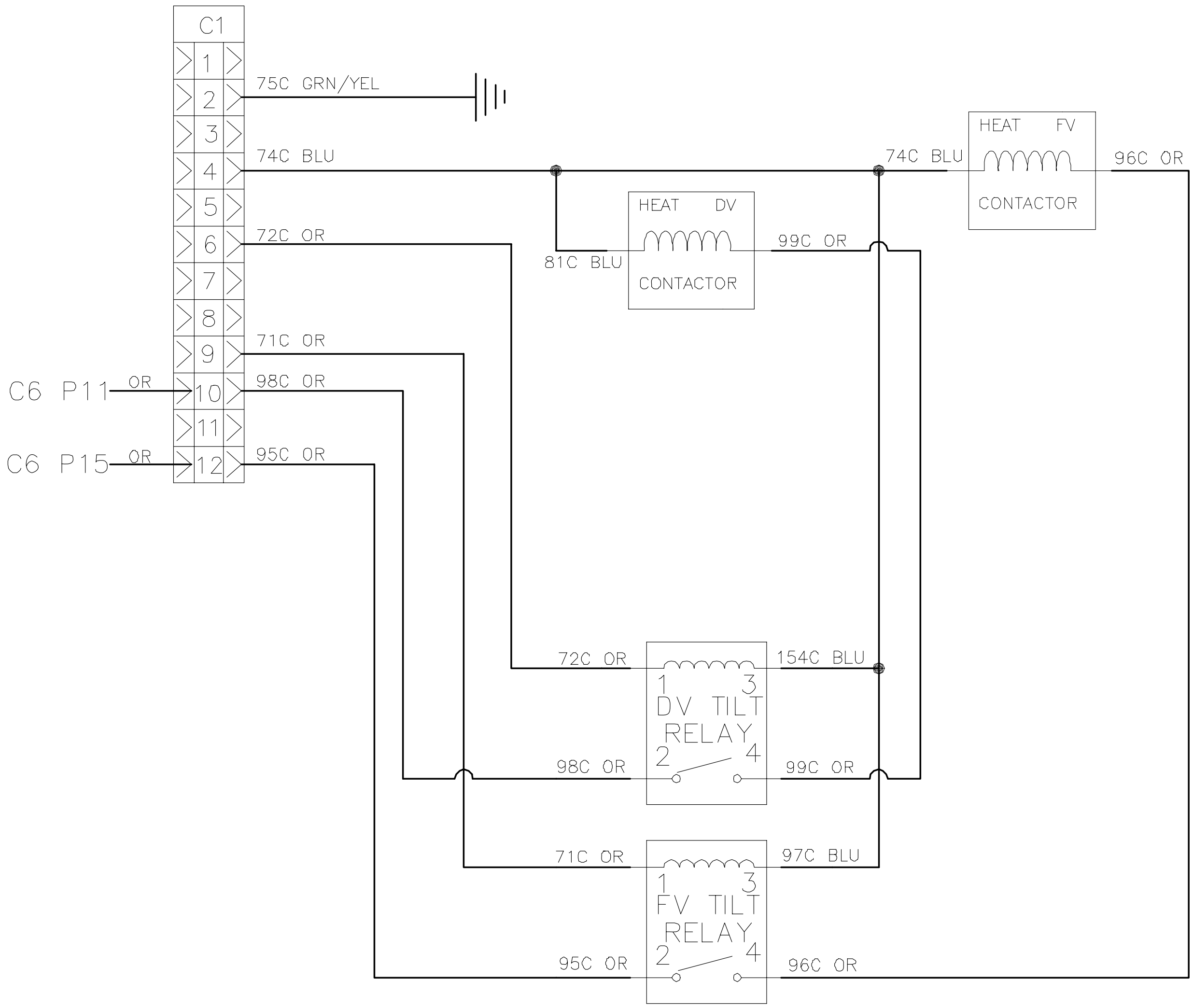
1.18.2 Component Wiring (CE)



1.18.3 Component Wiring (CSA)

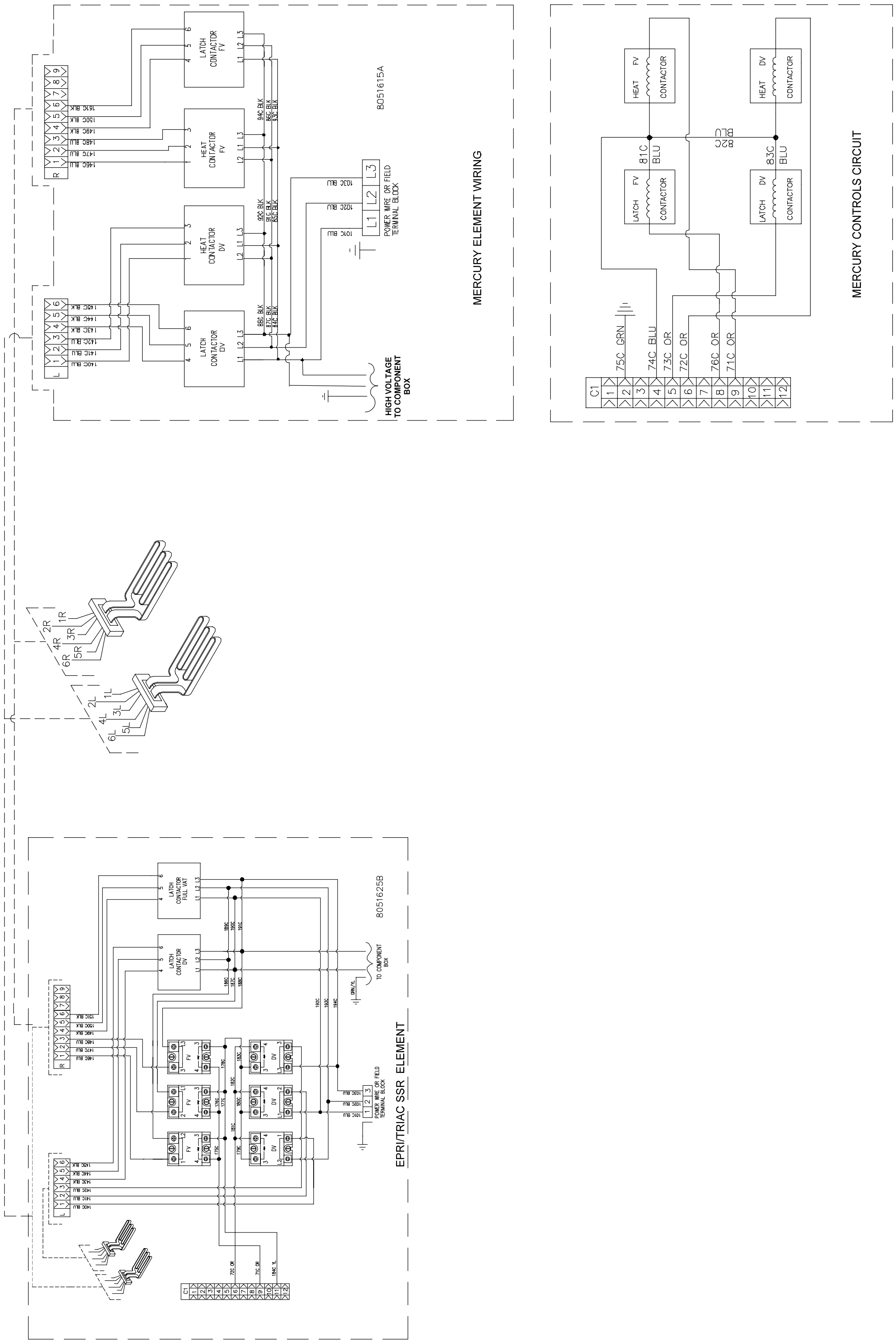


1.18.4 Tilt Switch Wiring

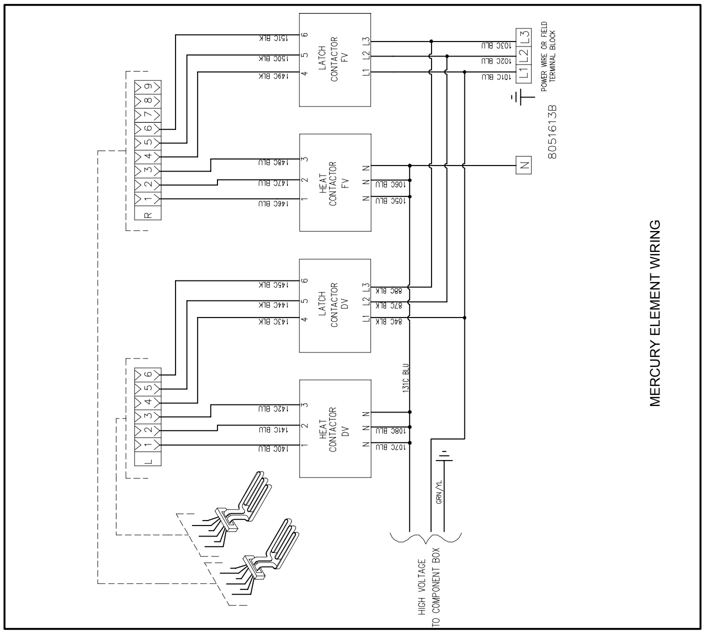


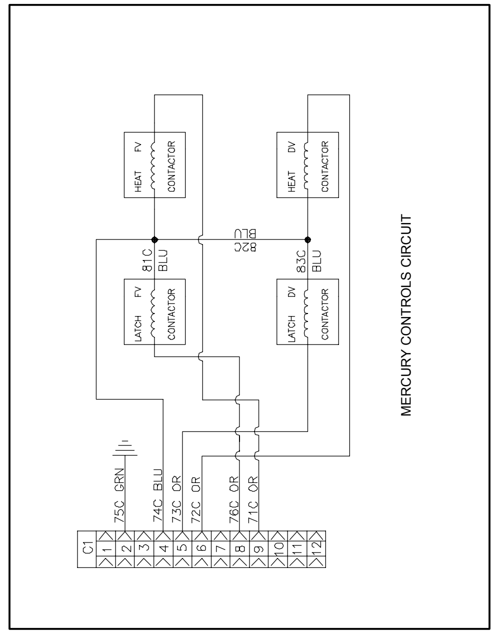
8051612B

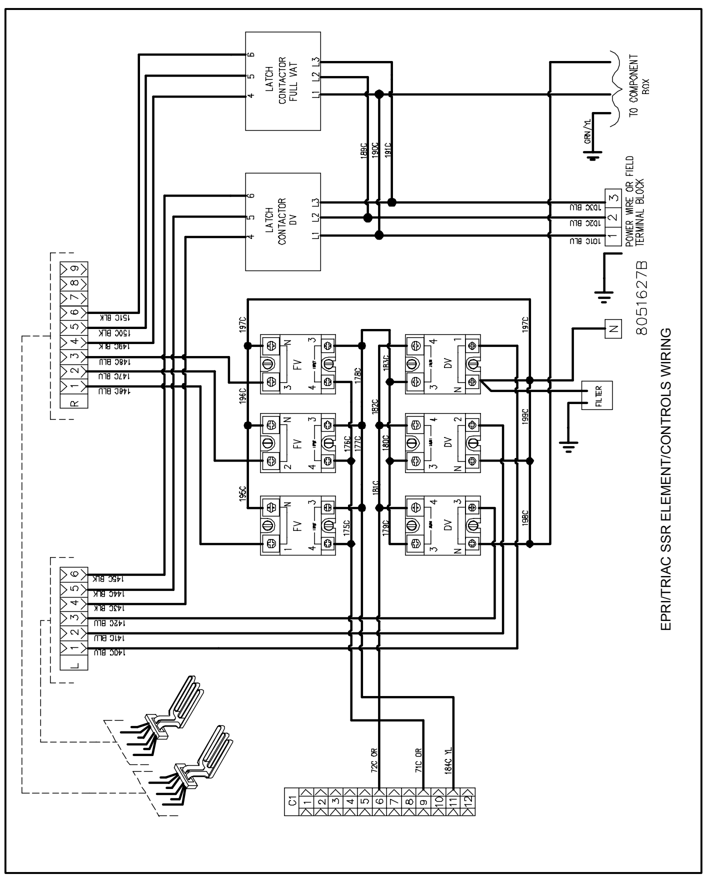
1.18.5 Contactor Box – Delta Configuration



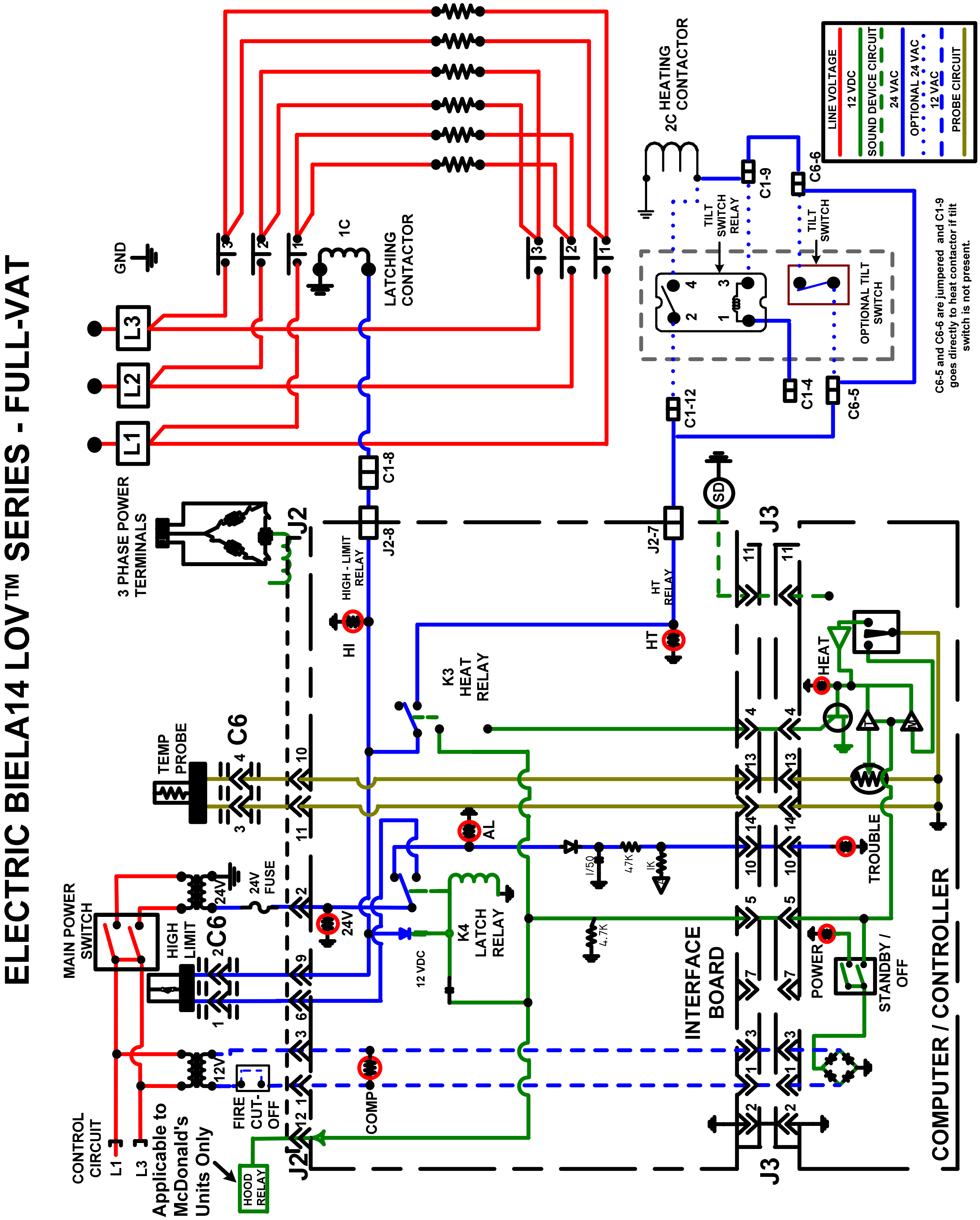
1.18.6 Contactor Box – WYE Configuration



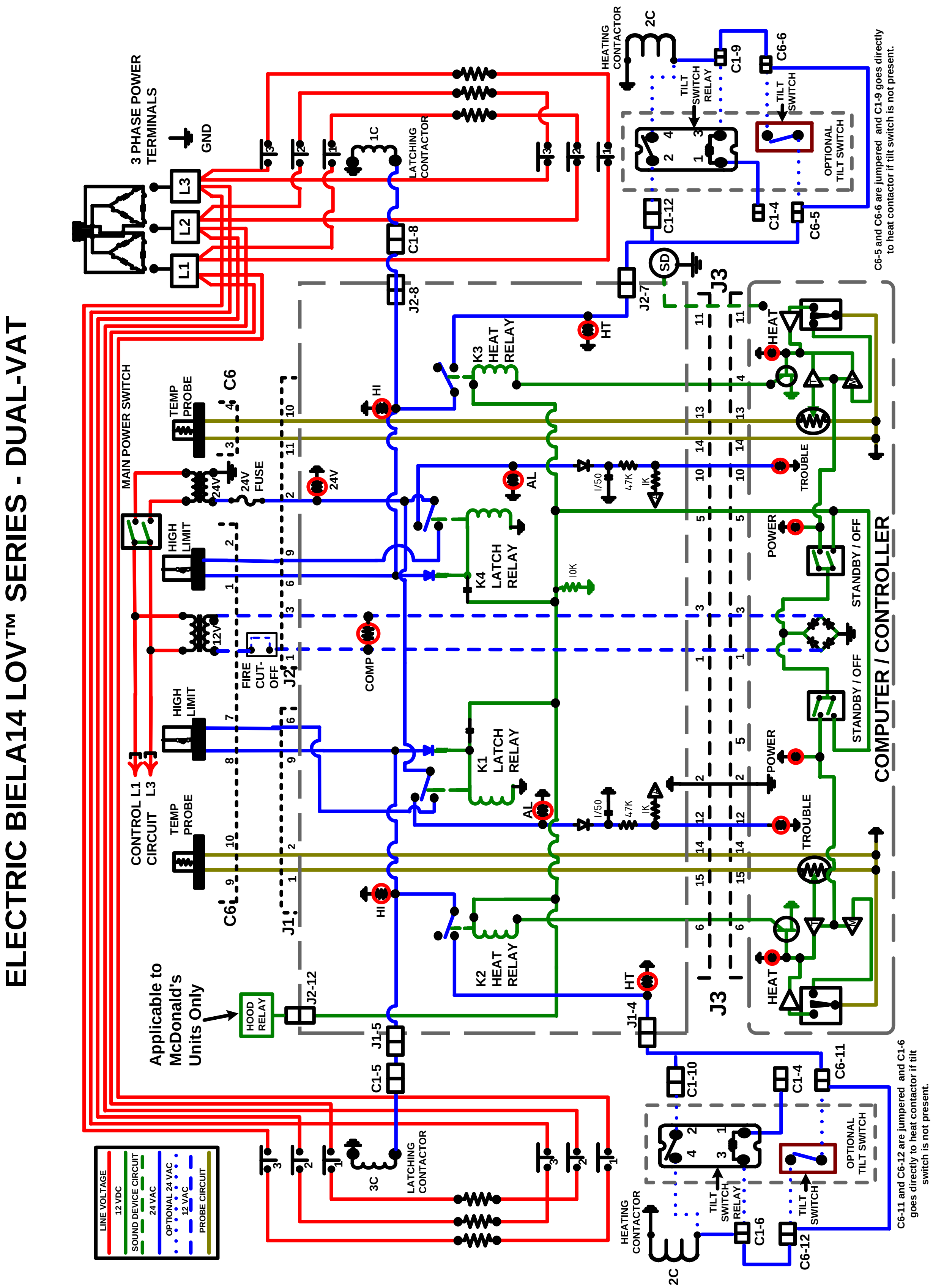




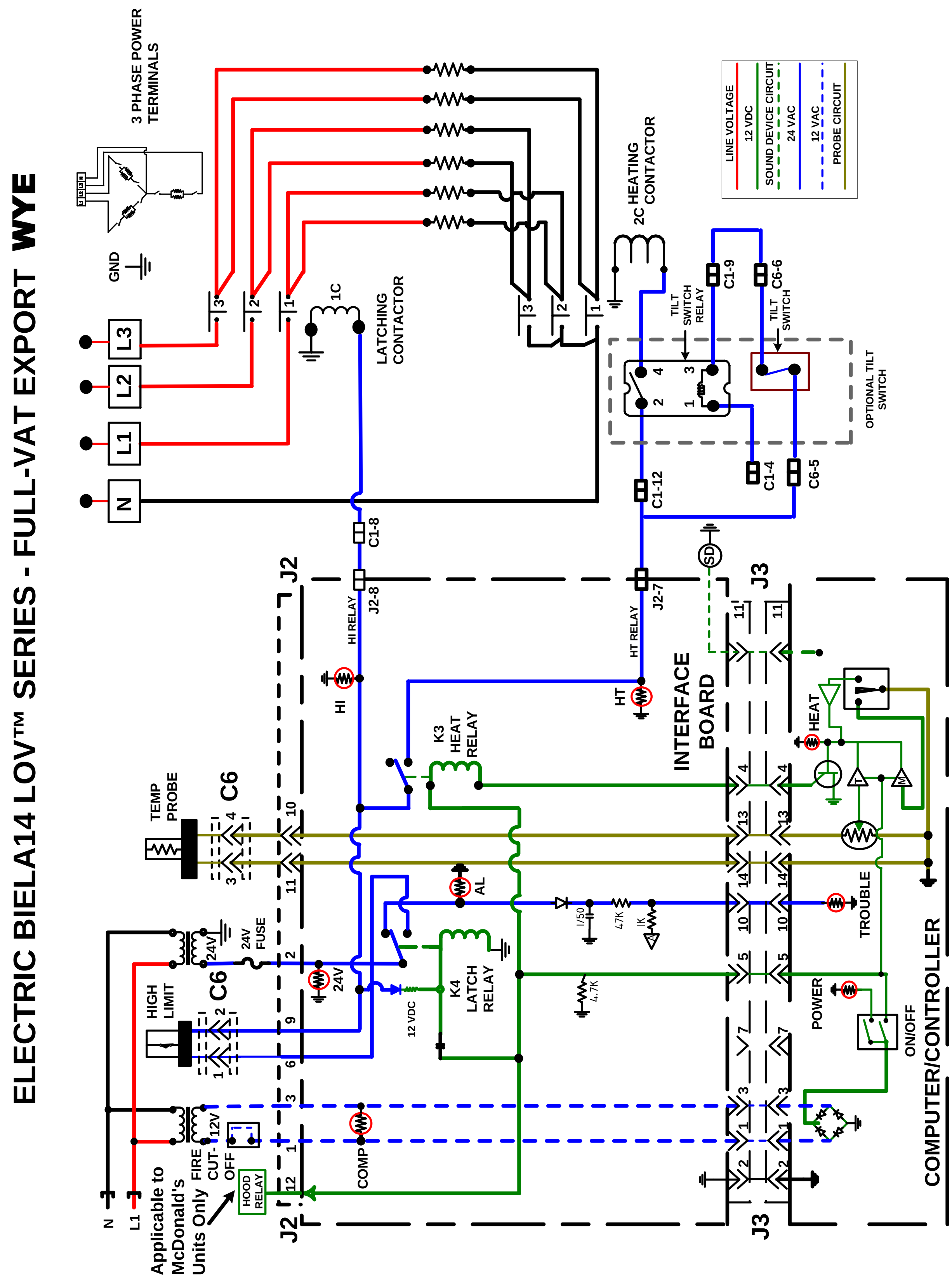
1.18.7 Simplified BIELA14 LOV™ Series – Full Vat Delta Wiring



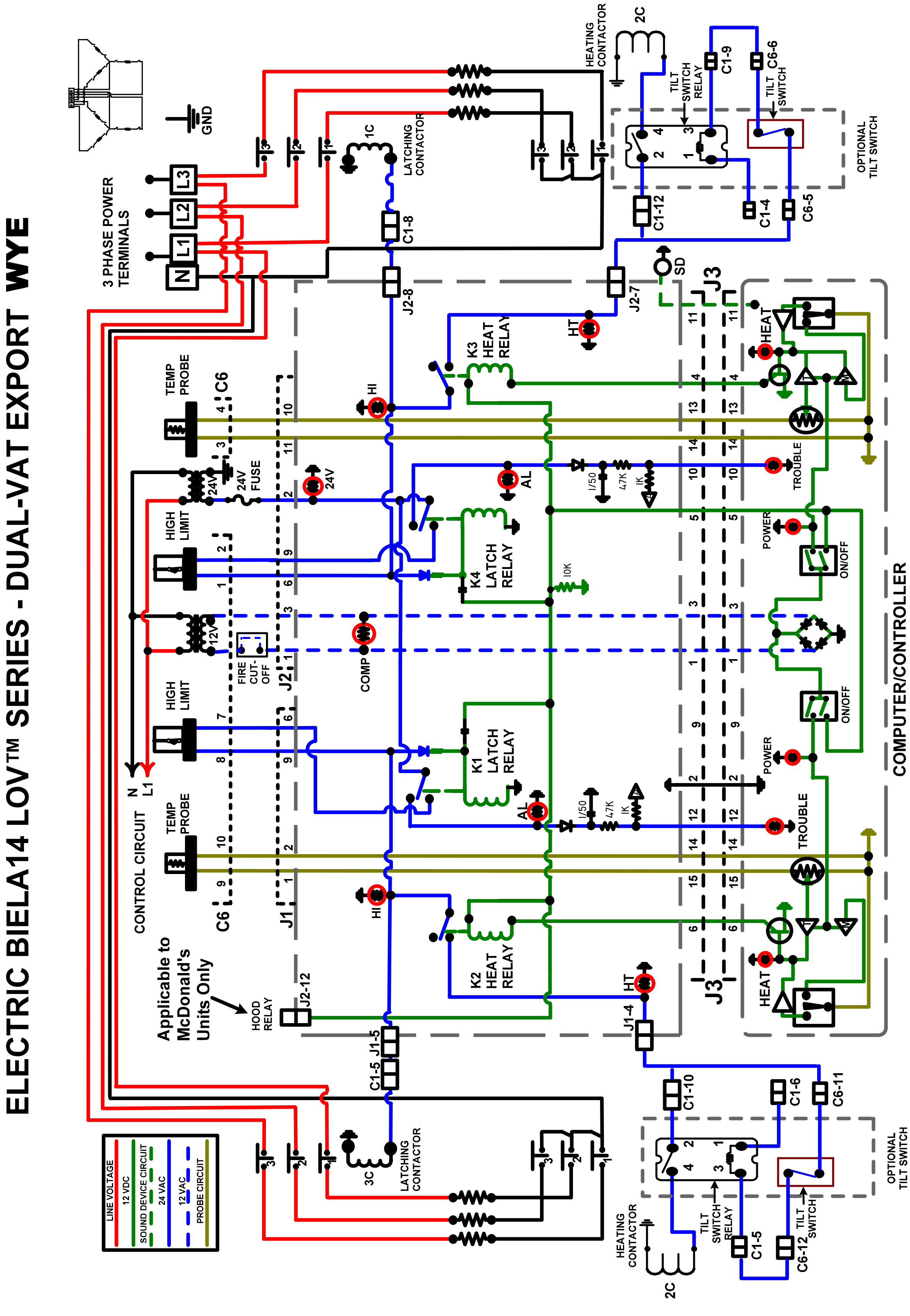
1.18.8 Simplified BIELA14 LOV™ Series – Dual Vat Delta Wiring



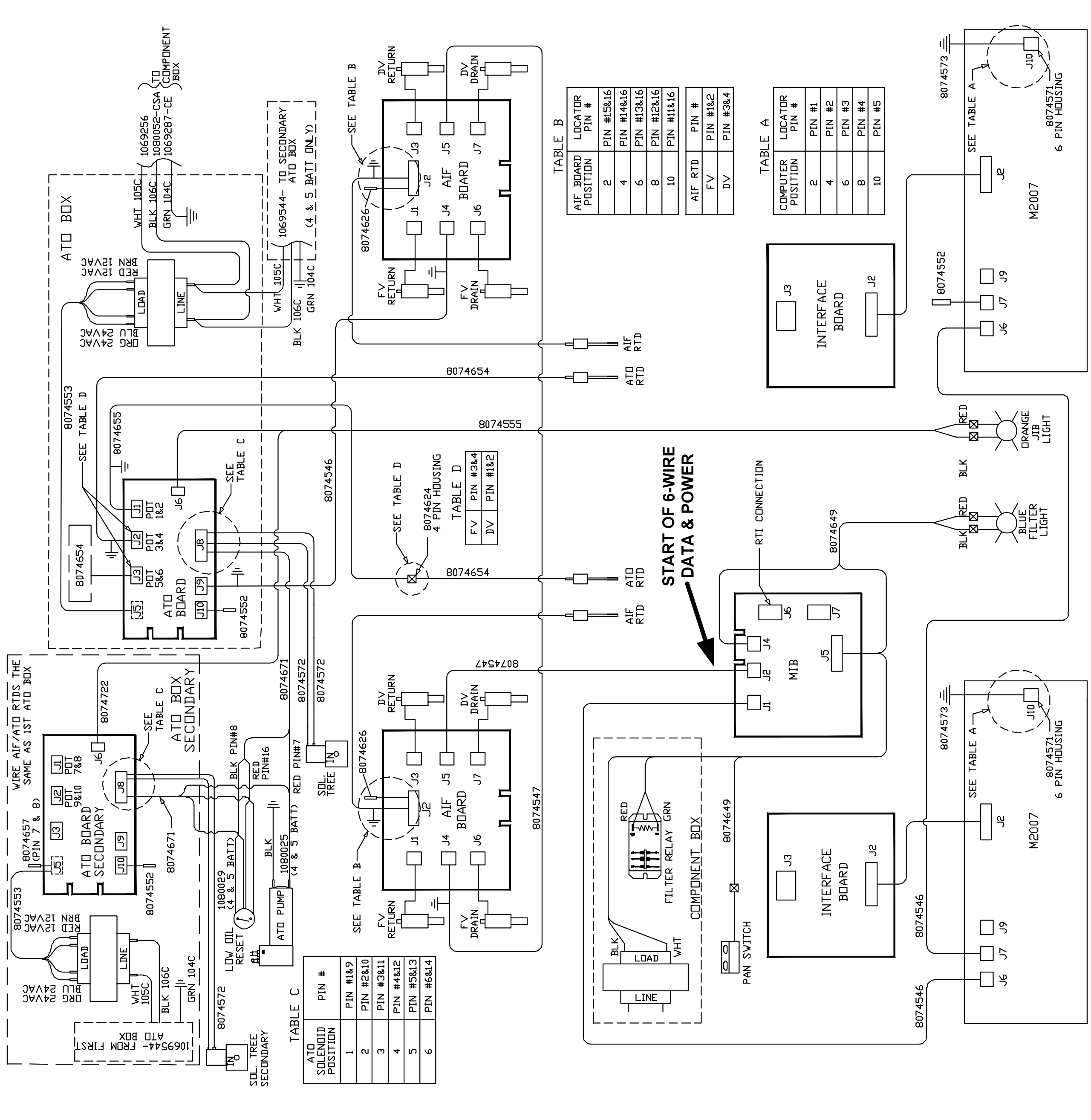
1.18.9 Simplified BIELA14 LOV™ Series – Full Vat Wiring EXPORT WYE



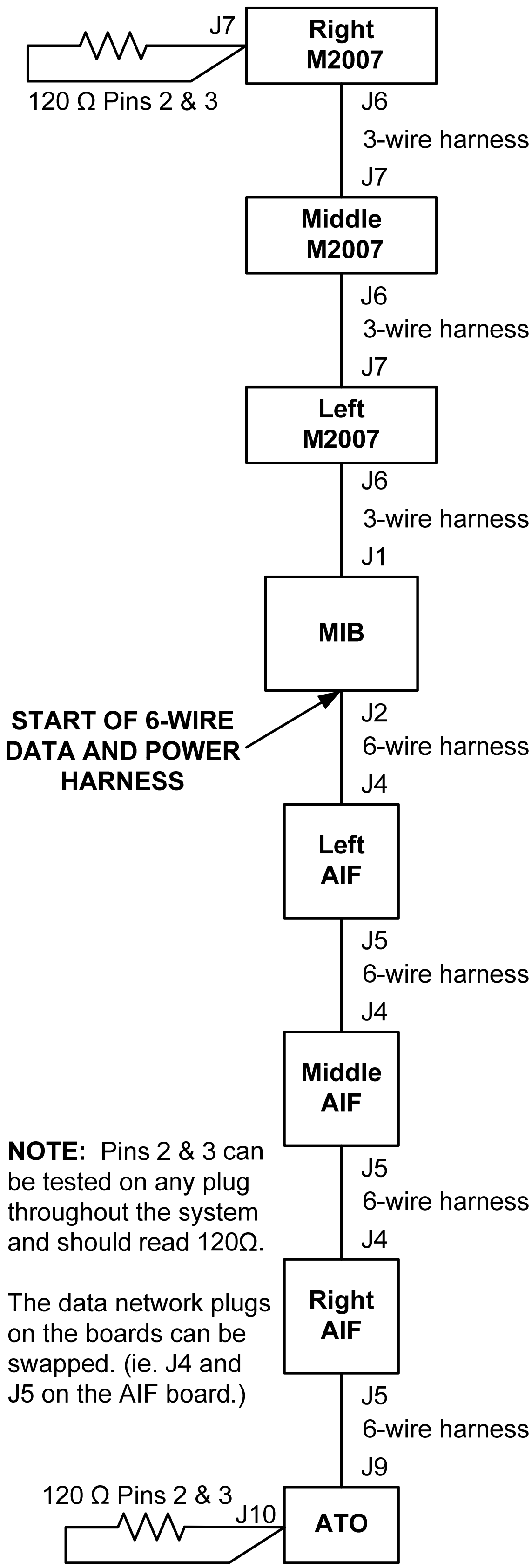
1.18.10 Simplified BIELA14 LOV™ Series – Dual Vat Wiring EXPORT WYE



1.18.11 BIELA14 Series LOV™ Simplified Wiring



1.18.12 BIELA14 Series LOV™ Data Network Flowchart

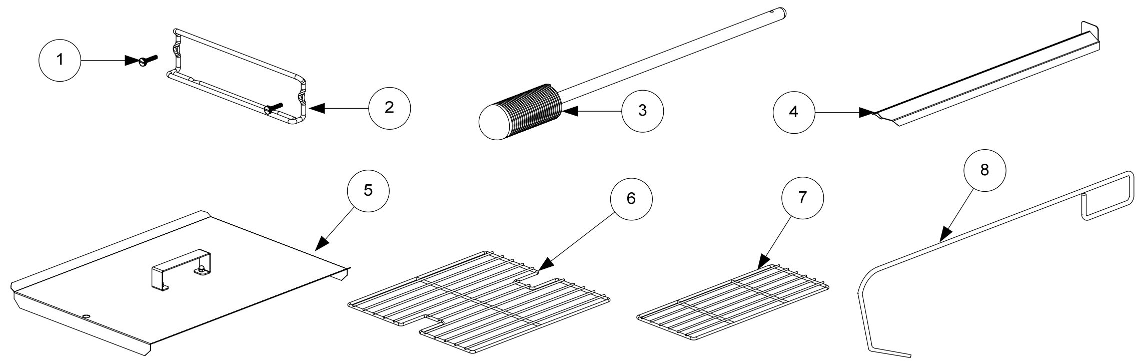


Harness	Pin #	Function	Voltage	Wire Color
3-wire harness	1	Ground		Black
	2	CAN Lo		Red
	3	CAN Hi		White
	4	NOT USED		
	5			
	6			

Harness	Pin #	Function	Voltage	Wire Color
6-wire harness	1	Ground		Black
	2	CAN Lo		Red
	3	CAN Hi		White
	4	5VDC+	5VDC	Black
	5	24VDC	24VDC	Red
	6	Ground		White

BIELA14 SERIES LOV™ ELECTRIC FRYERS
CHAPTER 2: PARTS LIST

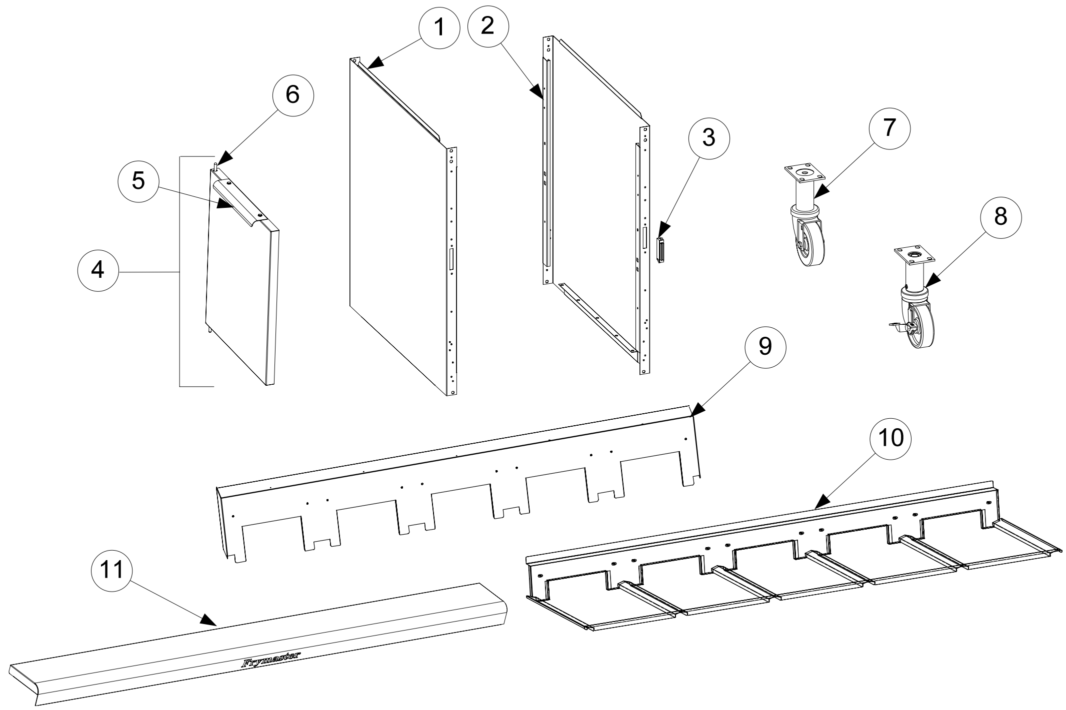
2.1 Accessories



ITEM	PART #	COMPONENT
1	809-0171	Thumbscrew, ¼ -20 X 1⅜-inch Universal Hood
	809-0402	Thumbscrew, ¼ -20 X ½-inch Cap-N-Splash Hood
2	810-2793	Hanger, Wireform Basket
*	809-0921	Spacer, Basket Hanger
3	803-0209	Brush, Frypot
4	823-5956	Connecting Strip, Frypot
5	106-8325	Cover, Full-Vat Frypot
*	106-8329	Cover, Dual-Vat Frypot
6	803-0132	Rack, Full-Vat Basket Support
7	803-0106	Rack, Dual-Vat Basket Support
8	803-0378	Element Lift / Fryers Friend LOV™
*	803-0002	Powder, Filter (80- 1-Cup Applications)
*	803-0046	Cup, Plastic Measuring
*	803-0170	Pack, 100-Sheet Filter Paper

*Not illustrated.

2.2 Doors, Sides, Tilt Housings, Cap-N-Splash, Top Caps and Casters

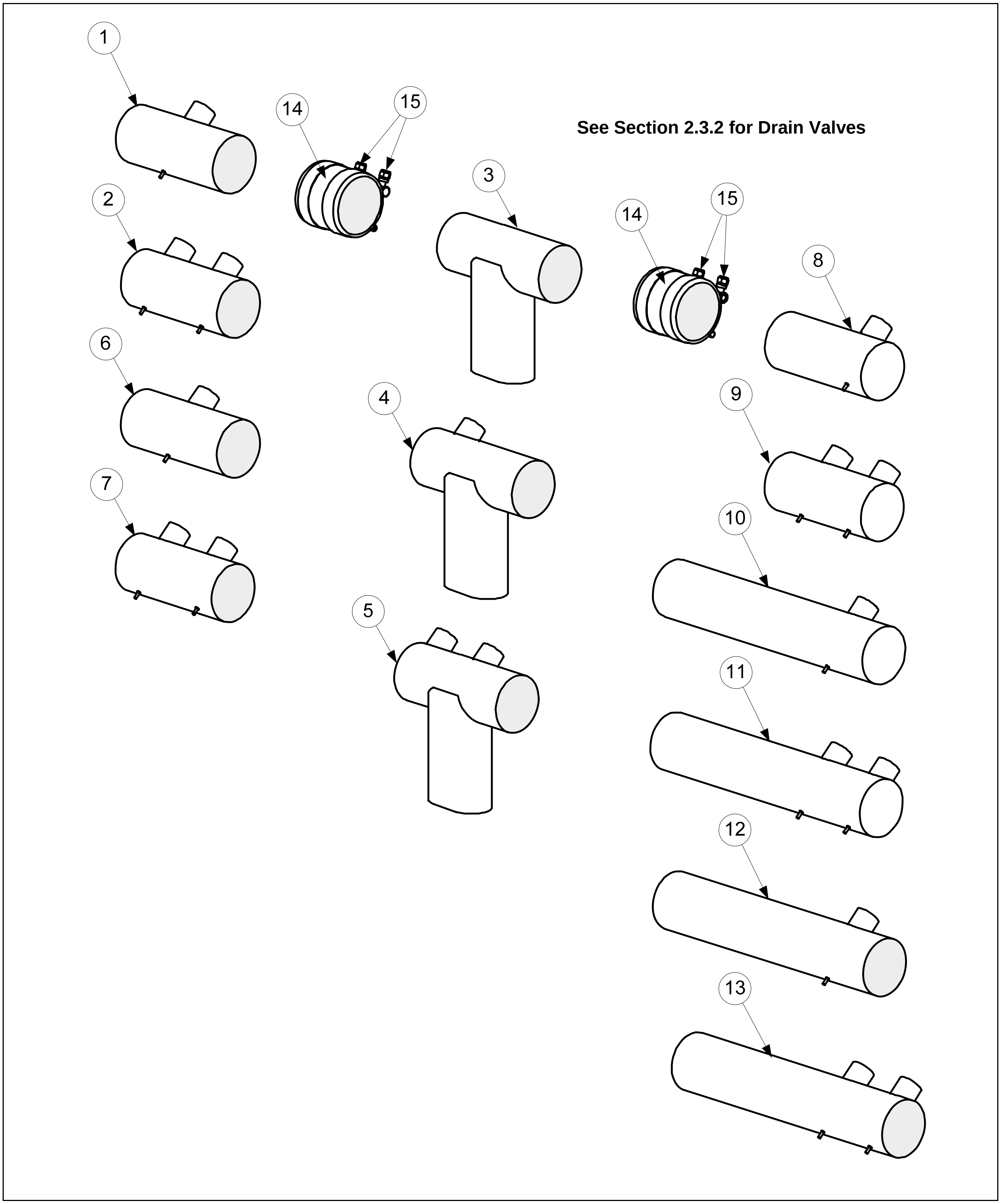


ITEM	PART #	COMPONENT
1	231-0323	Side, Standard Cabinet Left SS (use 221-0323 for Enameled Steel)
2	232-0323	Side, Standard Cabinet Right SS (use 222-0323 for Enameled Steel)
3	810-1105	Magnet, Door (vertical) (use 810-2346 for horizontal over filter pan)
4	106-4397	Door, Left or Right (Left shown – move handle to bottom for right)
5	230-4960	Handle, Eurolook Door
6	106-4067	Pin Assembly, Door
*	810-0275	Spring, Door Pin
*	809-0970	Retaining Ring
*	230-4685	Hinge, Door Lower
7	810-0327	Caster without Brake
8	810-0326	Caster with Brake
9		Tilt Housing (Housing for five station fryer shown)
	823-6085	Two Station, S/S ***(use 823-6460 for Aluminized Steel)***
	823-5700	Three Station, S/S ***(use 823-6461 for Aluminized Steel)***
	823-6151	Four Station, S/S ***(use 823-6462 for Aluminized Steel)***
	823-6243	Five Station, S/S ***(use 823-6885) for Aluminized Steel)***
10		Cap-N-Splash
	823-6420	Two Station
	823-6421	Three Station
	823-6422	Four Station
	823-6887	Five Station
11		Top Cap (Top cap for five station fryer shown)
	106-7835	Two Station ***(Also requires four 809-0078 10-32 Nutserts)***
	106-5979	Three Station ***(Also requires six 809-0078 10-32 Nutserts)***
	106-7576	Four Station ***(Also requires eight 809-0078 10-32 Nutserts)***
	106-7841	Five Station ***(Also requires ten 809-0078 10-32 Nutserts)***

* Not illustrated.

2.3 Drain System Components

2.3.1 Drain Tube Sections and Associated Parts

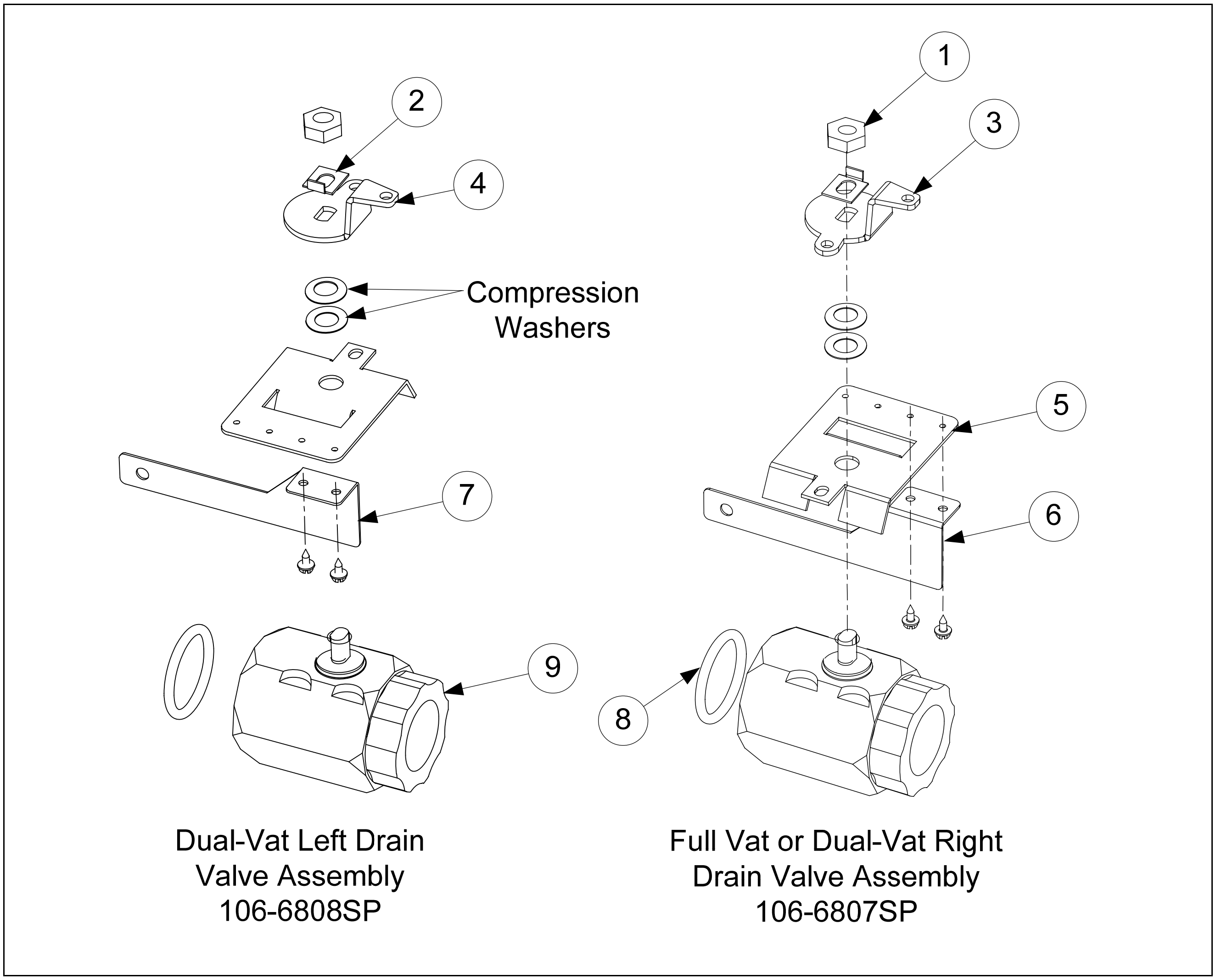


2.3.1 Drain Tube Sections and Associated Parts cont.

ITEM	PART#	COMPONENT
1	823-6020	Drain Tube, Full-Vat Left Closed/Right End Open
2	823-6112	Drain Tube, Dual-Vat Left Closed/Right End Open
3	823-6663	Drain Tube, Dump (Use 823-6770 for French Unit)
4	823-6664	Drain Tube, Full-Vat 2 Bat. Dump Left Closed/Right End Open
5	823-6239	Drain Tube, Dual-Vat 2 Bat. Dump Left Closed/Right End Open
6	823-6019	Drain Tube, Full-Vat Left and Right Open
7	823-6021	Drain Tube, Dual-Vat Left and Right Open
8	823-6240	Drain Tube, Full-Vat 2 Bat. Left Open/Right End Closed
9	823-6242	Drain Tube, Dual-Vat 2 Bat. Left Open/Right End Closed
10	823-6202	Drain Tube, Full-Vat Left Open/Right End Closed
11	823-6114	Drain Tube, Dual-Vat Left Open/Right End Closed
12	823-6117	Drain Tube, Full-Vat Left and Right Open
13	823-6115	Drain Tube, Dual-Vat Left and Right Open
14	816-0625	Sleeve
15	809-0969	Clamp
*	816-0630	Vinyl Cap

***** Not illustrated.

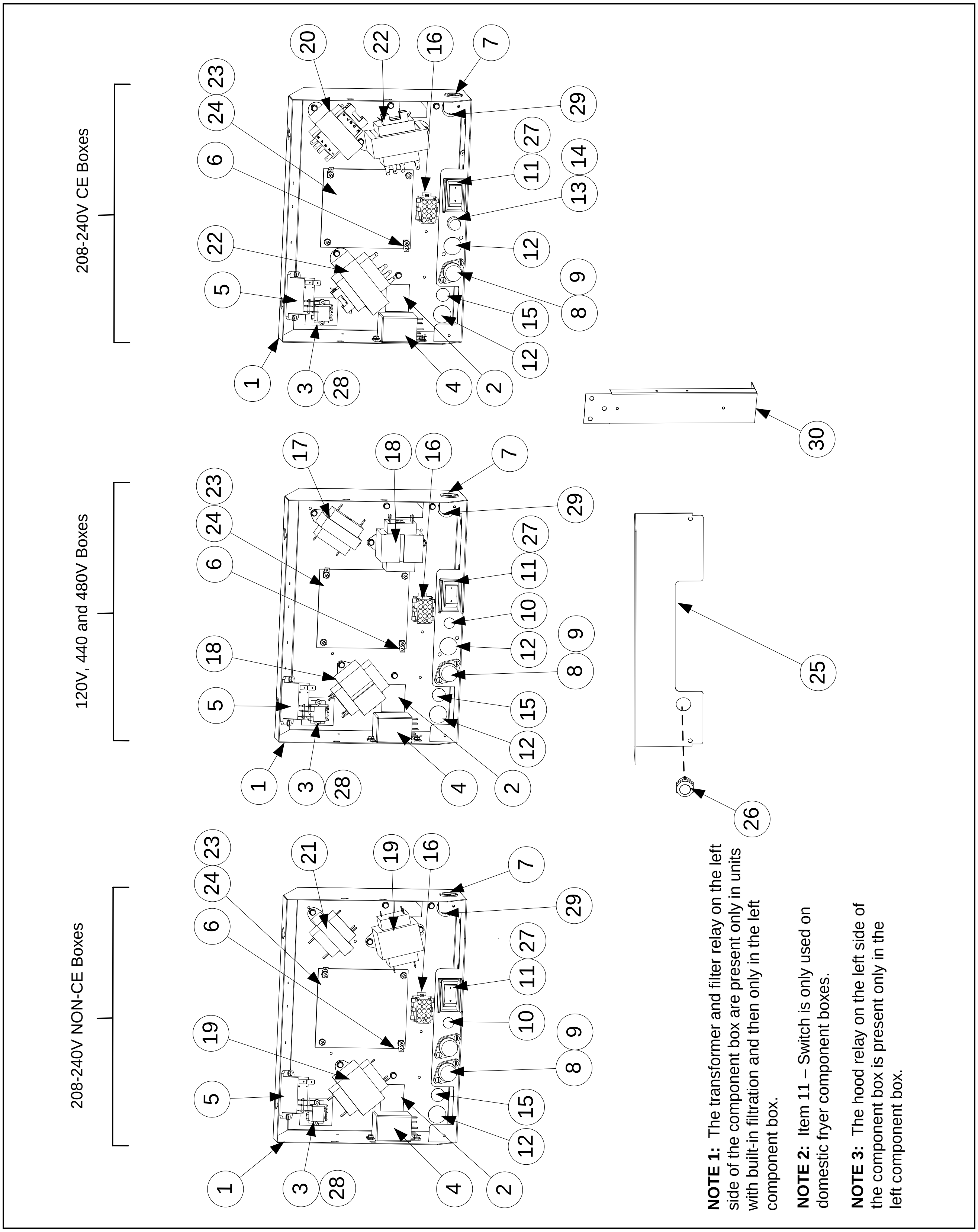
2.3.2 Drain Valves and Associated Parts



ITEM	PART #	COMPONENT
1	809-0540	Nut, ½-13 2-Way Hex Lock
2	900-2936	Retainer, Nut Drain Valve
3	232-4991	Handle, Drain Valve FV or DV Right
4	231-2707	Handle, Drain Valve DV Left
5	220-4993	Bracket, Drain Securing LOV™
6	222-2111	Bracket, Drain Tube FV or DV Right
7	221-2111	Bracket, Drain Tube DV Left
8	816-0544	O-Ring, Round Drain Seal
9	810-3524	Valve, 1¼-inch Drain

2.4 Electronics and Wiring Components

2.4.1 Component Boxes



NOTE 1: The transformer and filter relay on the left side of the component box are present only in units with built-in filtration and then only in the left component box.

NOTE 2: Item 11 – Switch is only used on domestic fryer component boxes.

NOTE 3: The hood relay on the left side of the component box is present only in the left component box.

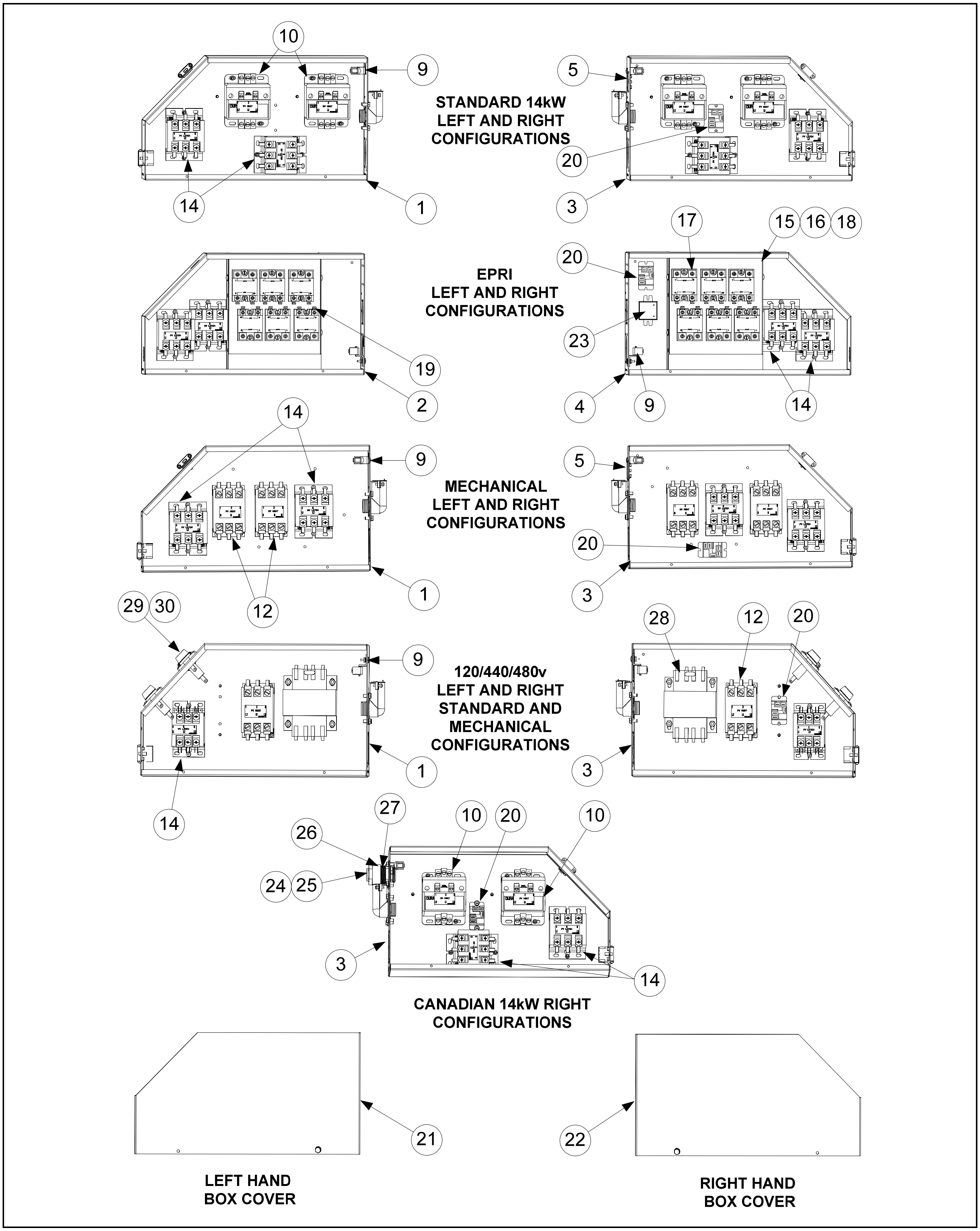
2.4.1 Component Boxes cont.

ITEM	PART #	COMPONENT
1	106-5592	Box Assembly, Component
2	200-3300	Bracket, Component Box Strain Relief
3	806-9495SP	Terminal Block
4	807-2515	Relay, 120V SPDT 10A ***(used in Canadian models only)***
5	807-4482	Relay, Filter 2 Pole 30A DPDT 24VDC
6	807-0037	Terminal, ¼-inch Push-on
7	807-0121	Bushing, Heyco Plastic AB-625-500
8	807-0922	Holder, Buss Fuse HPS
9	807-2278	Fuse, 20 Amp
10	810-2446	Plug, Button .50 Heyco Double "D"
11	807-4036	Switch, Power
	807-3575	Plug, Carling Switch Hole *(used on some models without a switch)*
12	807-1947	Plug, Button .875 Dome
13	807-1321	Holder, AGC Panel Mount ¼" Fuse *(Some models use item 10 here.)*
14	807-1597	Fuse, 3 AMP Slow-Blow
15	810-2445	Plug, Button .625 Heyco Double "D"
16	106-5750	Harness Assembly, RE FV Control
	106-5751	Harness Assembly, RE DV Control
17	807-0855	Transformer, 100-120V/12V 20VA
18	807-0800	Transformer, 100-120V/24V 50VA Filter
19	807-0680	Transformer, 208-240V/24V 20VA Filter
20	807-2191	Transformer, 208-240V/12V 30VA
21	807-0979	Transformer, 208-240V/12V 43VA
22	807-2180	Transformer, 208-240V 50VA Filter
23	809-0349	Spacer, 4mm X 6mm Aluminum
24		Interface Board
	826-2260	Standard Full or Dual Vat Interface Board *(includes sound harness)*
	826-2261	EPRI, Full- or Dual-Vat *(includes sound harness)*
*	807-4403	Speaker, 4-Watt SMT
25	220-4723	Guard, Finger w/ switch opening
26	807-4678	Switch, Momentary Flush JIB Reset
27	230-0834	Guard, RE Box Switch
28	816-0217	Paper, Insulating Terminal Block
29	810-0045	Bushing, .875 Diameter 11/16"
30	200-6654	Brace, Component Box
*	826-2249	RE Hood/Ansul Interlock Kit (includes terminal block, wires and connectors)

* Not illustrated.

2.4.2 Contactor Boxes

2.4.2.1 Left and Right Contactor Box Configurations



2.4.2.1 Left and Right Contactor Box Configurations

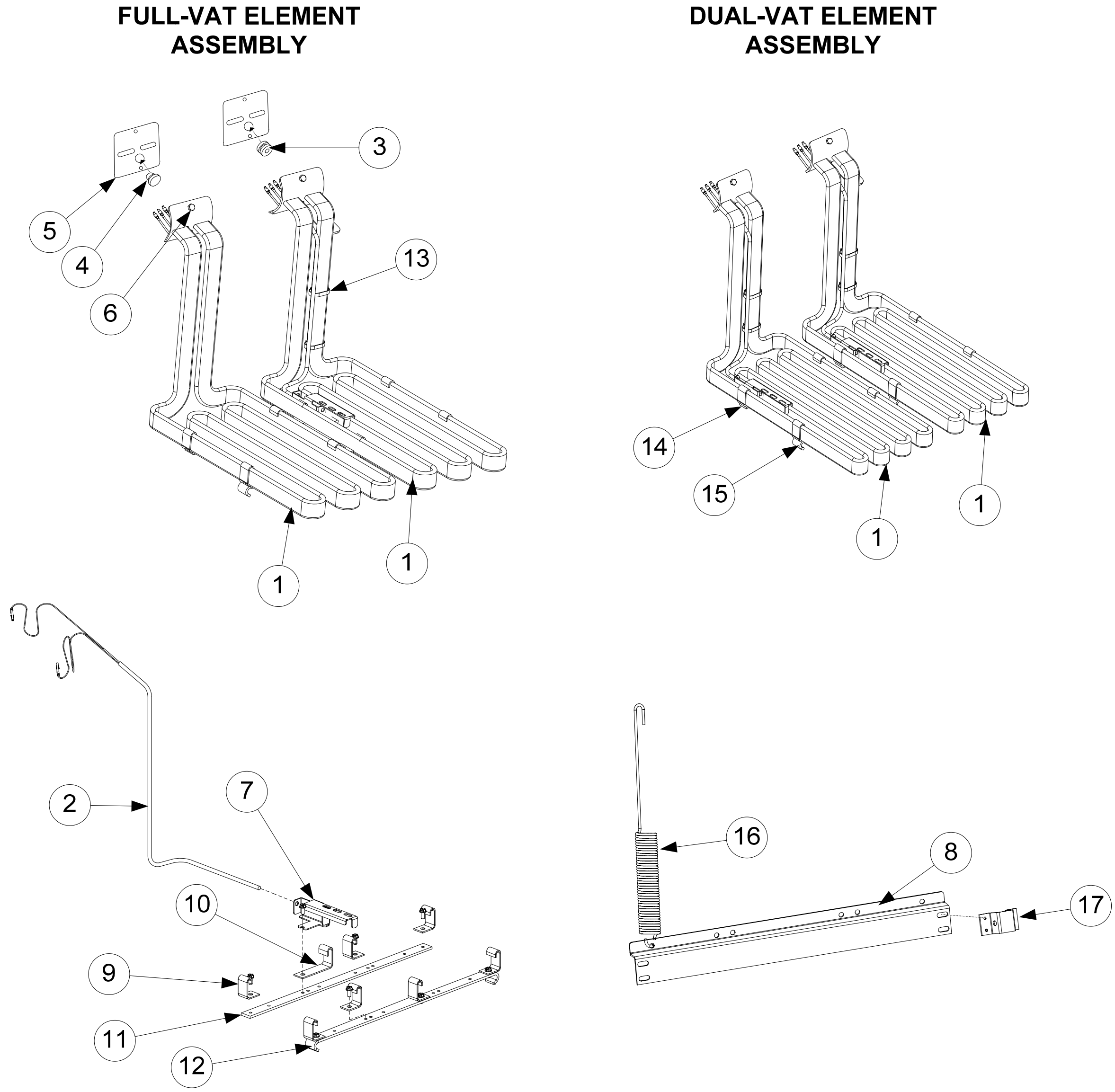
NOTES: Left and right contactor box assemblies are mirror images of one another. With the exception of the box itself, all components of a left-hand assembly are the same as those in the corresponding right-hand assembly and vice versa except for the hood relay which occurs in the right or large box only. The configurations illustrated show all possible components, but a particular configuration may not have all the components shown.

ITEM	PART #	COMPONENT
1	106-8658	Box Assembly, Left Contactor
2	823-6538	Box Assembly, Left Contactor **EPRI**
3	106-8660	Box Assembly, Right Contactor
4	823-6539	Box Assembly, Right Contactor **EPRI**
5	810-2554	Plug, Cord Cutout 1.125 Button
6	807-1947	Plug, .875 Diameter Dome
7	221-0482	Cover, Left Hand Contactor Box
8	222-0482	Cover, Right Hand Contactor Box
9	807-0070	Terminal, Ground Lug
10	807-1071	Contactor, 24V 30 Amp Mercury (Heat)
11	807-0884	Contactor, 24V 50 Amp Mercury (Heat)
12	807-2284	Contactor, 24V 50 Amp Mechanical (Heat)
13	807-2283	Contactor, 24V 63 Amp Mechanical (Heat)
14	810-1202	Contactor, 24V 40 Amp Mechanical (Latch)
15**	806-8674	Heatsink Assembly, DV Solid State Relay (See components below)
16**	806-8673	Heatsink Assembly, FV Solid State Relay (See components below)
		Components of Items 15 and 16
17	826-1562	Kit Relay, Solid State 40 Amp 280V with Heatsink
18	807-2749	Heatsink, Solid State
19	807-0037	Terminal, ¼-inch Push-on
20	807-1683	Relay, Hood 12VDC
21	221-0482	Cover, Left Contactor Box Top
22	222-0482	Cover, Right Contactor Box Top
23	106-6204	Filter Assembly, EPRI ***(used in CE WYE-configured EPRI units only)***
24	807-4316	McDonald’s Cordset, 120V 5-Wire
25	807-4317	McDonald’s Cordset, Europe 3-Wire Single Phase
26	807-1560	Strain Relief
27	220-1102	Plate, MRE Control Cord Relief
28	807-0064	Transformer, 480V/120V 150VA
29	807-0922	Holder, Bus Fuse
30	807-2278	Fuse, 20 Amp
*	221-0610	Bracket, Left Hand Contactor Box Mounting
*	222-0610	Bracket, Right Hand Contactor Box Mounting
*	807-0012	Relay, Tilt Switch 18 Amp 1/3 HP 24 V Coil

* Not illustrated.

** Dual-vat assembly has six relays (826-1562); Full-vat assembly has three relays.

2.4.3 Heating Element Assemblies and Associated Parts
2.4.3.1 Element Assemblies and Hardware



NOTES:
The dual-vat assembly is almost the same as the full-vat assembly except for having two of Items 2 and 7, two of Item 14 in place of Item 11, two of Item 15 in place of Item 12, and two of Items 3 and Items 4. The only difference between element assemblies for different voltage and kW ratings is the element itself (Item 1).

Items 8, 16 and 17 are shown as associated parts. The are not part of either assembly.

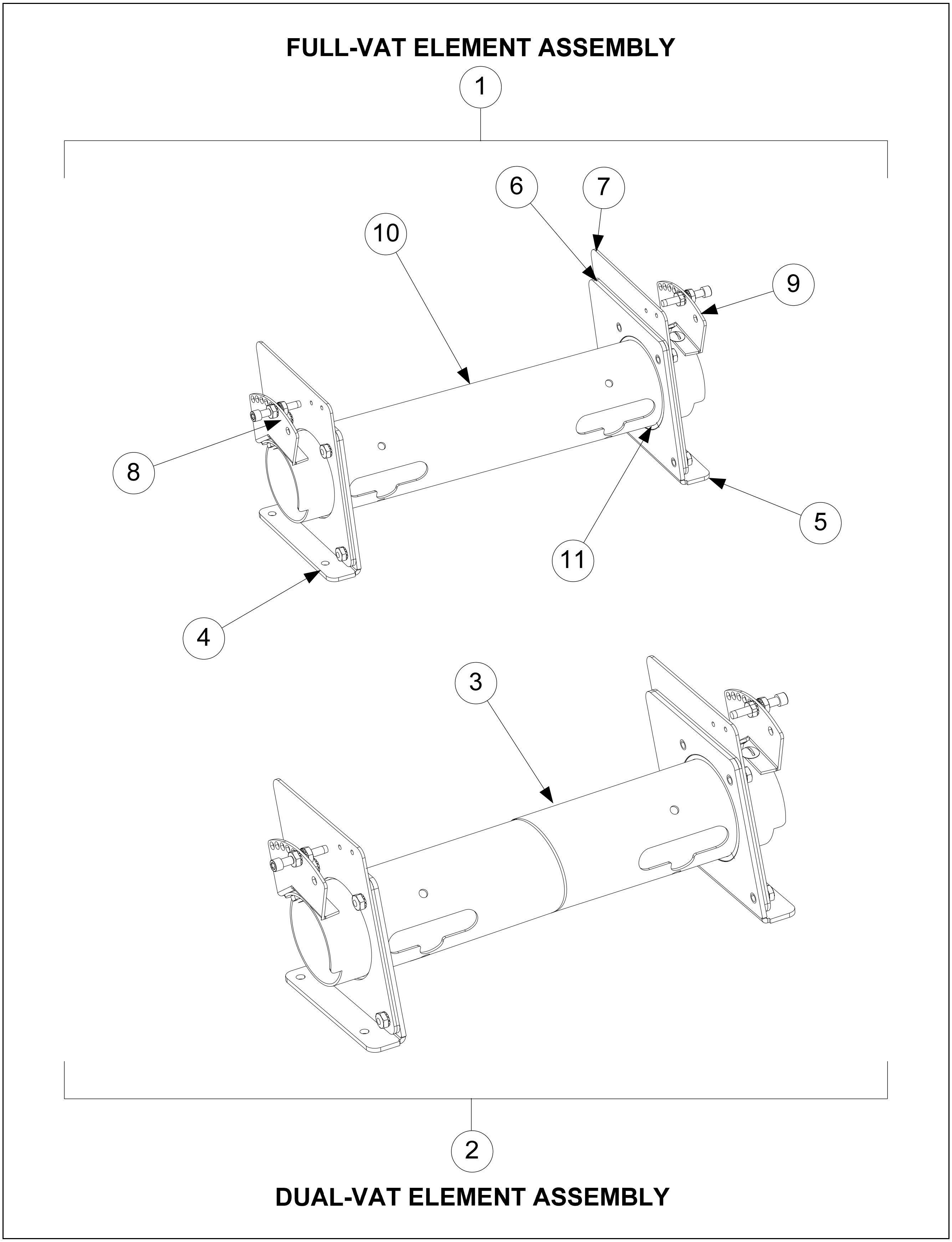
NOTE: These elements apply only to BIELA14 series fryers.

2.4.3.1 Element Assemblies and Hardware cont.

ITEM	PART #	COMPONENT
1		Element
	826-2198	200V 7.0 kW **(220V 8.5kW used in some export 3-phase 4-wire WYE units)**
	826-2192	208V 7.0 kW
	826-2200	220V 7.0 kW **(240V 8.5kW used in some export 3-phase 4-wire WYE units)**
	826-2193	230V 7.0 kW
	826-2199	230V/400V 7.0/8.5 kW **(used in some export 3-phase 4-wire WYE units)**
	826-2194	240V 7.0 kW
	826-2196	480V 7.0 kW
2	826-2212	Probe, Temperature RE – includes tie wraps and grommet.
3	816-0681	Grommet, Probe
4	816-0480	Plug, .375-inch Dome
5	816-0688	Gasket, Element
6	809-1003	Screw, 10-32 X ⅜-inch Hex Head SS
*	809-0766	Nut, 10-32 Keps Hex Head SS
*	230-4028	Wrench, Element Tube Nut Spanner
7	230-3714	Bracket, Temperature Probe 7.0kW
	230-0784	Bracket, Temperature Probe 8.5kW **(used in some export 3-phase 4-wire WYE units)**
8	220-0464	Bracket, Lower Spring
9	910-2042	Clamp, Element (Short)
10	230-0781	Clamp, Element (Long)
11	230-4902	Support, Full-Vat Element Rear
12	230-4101	Support, Full-Vat Element Front
13	809-0567	Tie-Wrap, Metal
14	230-4903	Support, Dual-Vat Element Bottom Rear
15	230-4103	Support, Dual-Vat Element Bottom Front
16	810-3030	Spring, Element Lift Left
	810-3131	Spring, Element Lift Right
17	220-0733	Bracket, Lower Spring Mating

* Not illustrated.

2.4.3.2 Element Tube Assemblies

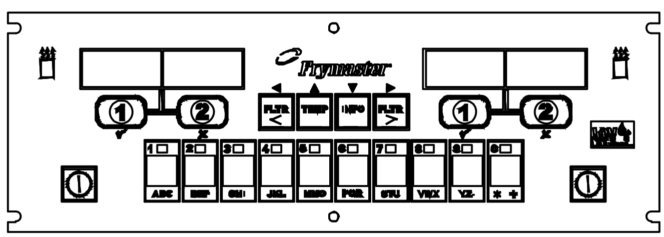


2.4.3.2 Element Tube Assemblies contd.

ITEM	PART #	COMPONENT
1	106-7653SP	Tube Assembly RE Element, Full-Vat
2	106-7654SP	Tube Assembly RE Element, Dual-Vat
3	810-3246	Bushing and Tube Assembly, Dual-Vat
4	106-5329	Bracket Assembly, LH Element Tube Support
5	106-5330	Bracket Assembly, RH Element Tube Support
6	220-0122	Plate, Element Tube Support Inner
7	220-0123	Plate, Element Tube Support Outer
8	106-7651	Bracket Assembly, LH Upper Spring ***(use 106-6569 for 17kW)***
9	106-7652	Bracket Assembly, RH Upper Spring ***(use 106-6570 for 17kW)***
10	810-2992	Tube, Full Vat Element Mounting
11	810-2993	Bushing, Tube End Teflon
*	106-6587	Magnetic Position Sensor Assembly
*	826-2228	Magnetic Position Sensor Assembly with Bracket
*	810-3007	Magnet
*	230-0794	Bracket, Magnetic Position Sensor Wire

* Not illustrated.

2.4.4 Computers

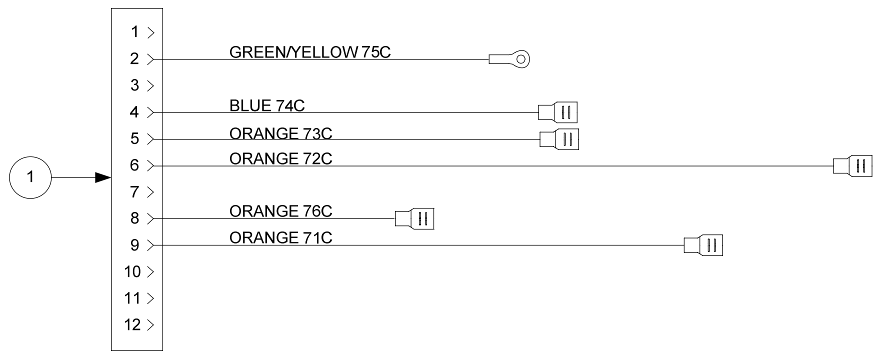


NOTE: See Page 2-17 for Interface Board to Computer Wiring Harness

ITEM	PART #	COMPONENT
		Replacement Computer
	106-8195SP	Non-CE Domestic M2007 *(For use in US, Canada, Mexico and all other non-CE countries)*
	106-8197SP	CE M2007 Full Vat *(For use in European CE countries)*

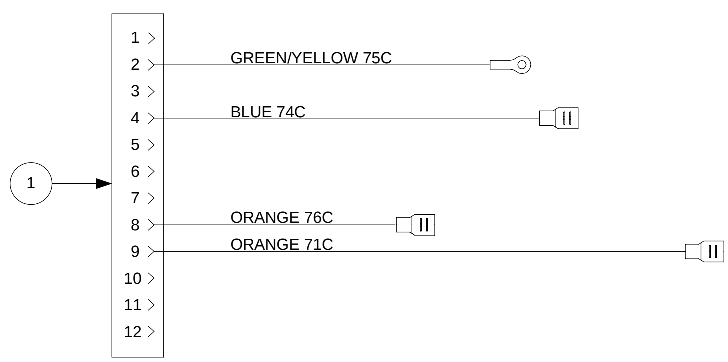
2.4.5 Wiring

2.4.5.1 Contactor Box Wiring Assemblies – 12-Pin Dual-Vat C-1



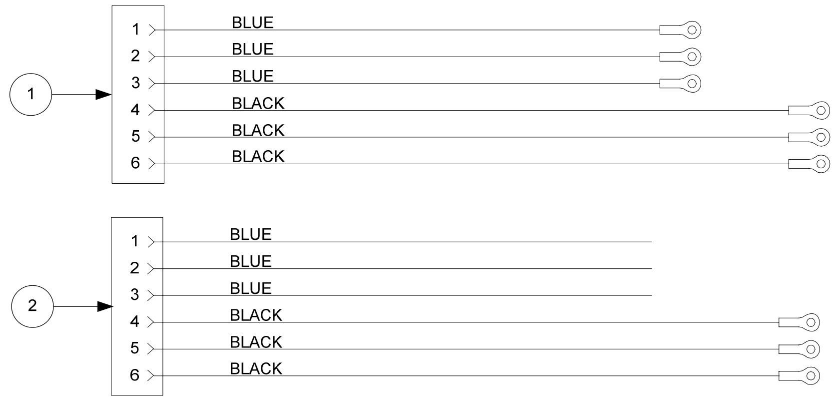
ITEM	PART #	COMPONENT
1	106-5980SP	Contactor Box Harness Assembly Dual Vat Standard (See wiring diagrams on pages 1-41 thru 1-43.) EPRI (uses harness above plus wire kits WIR0734 and WIR0737) (See wiring diagrams on pages 1-45 and 1-46.)

2.4.5.2 Contactor Box Wiring Assemblies – 12-Pin Full-Vat C-1



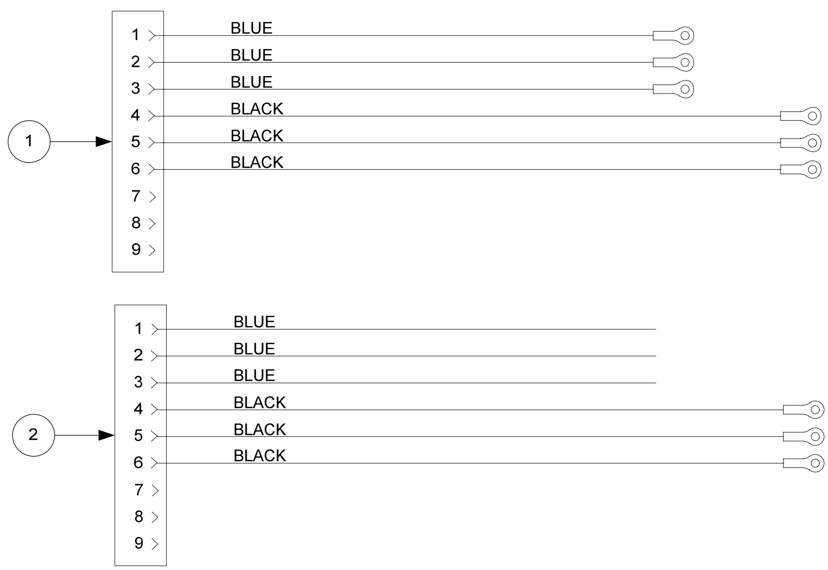
ITEM	PART #	COMPONENT
1	106-6031SP	Contactor Box Harness Assembly Full Vat Standard (See wiring diagrams on pages 1-41 thru 1-43.) EPRI (uses harness above plus wire kits WIR0733 and WIR0736) (See wiring diagrams on pages 1-45 and 1-46.)

2.4.5.3 Contactor Box Wiring Assembly – 6-Pin (Left Element)



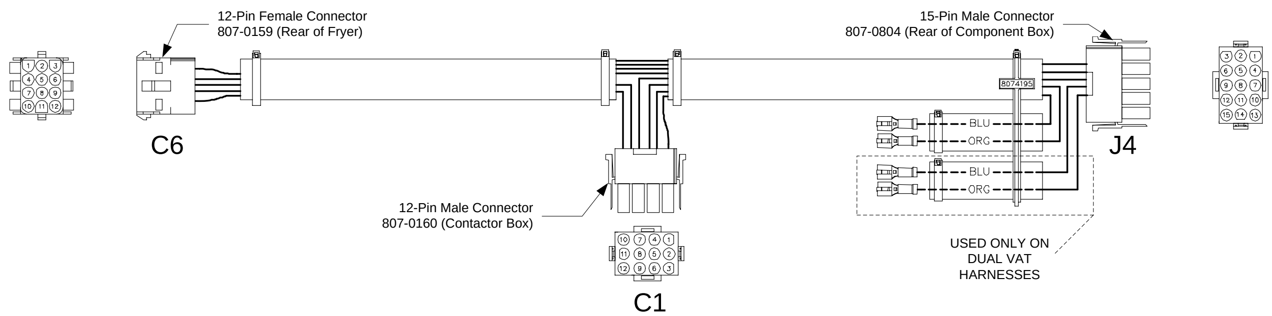
ITEM	PART #	COMPONENT
1	106-6768SP	14/17 kW Standard Mercury Contactor
2	106-6771SP	14/17 kW Mechanical Contactor

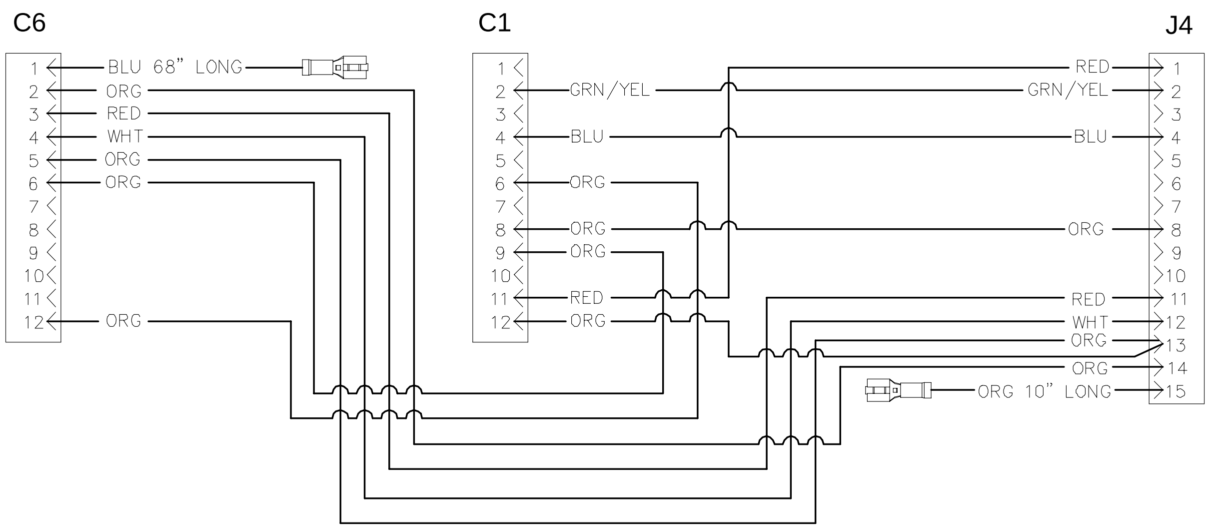
2.4.5.4 Contactor Box Wiring Assembly – 9-Pin (Right Element)



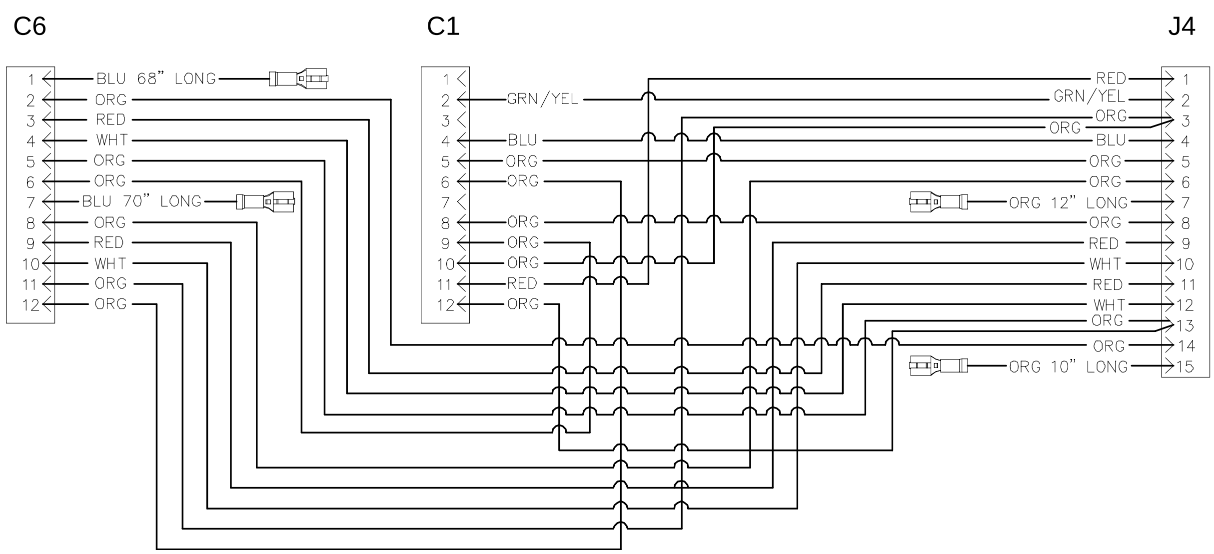
ITEM	PART #	COMPONENT
1	106-6769SP	14/17 kW Standard Mercury Contactor
2	106-6772SP	14/17 kW Mechanical Contactor

2.4.5.5 Main Wiring Harnesses



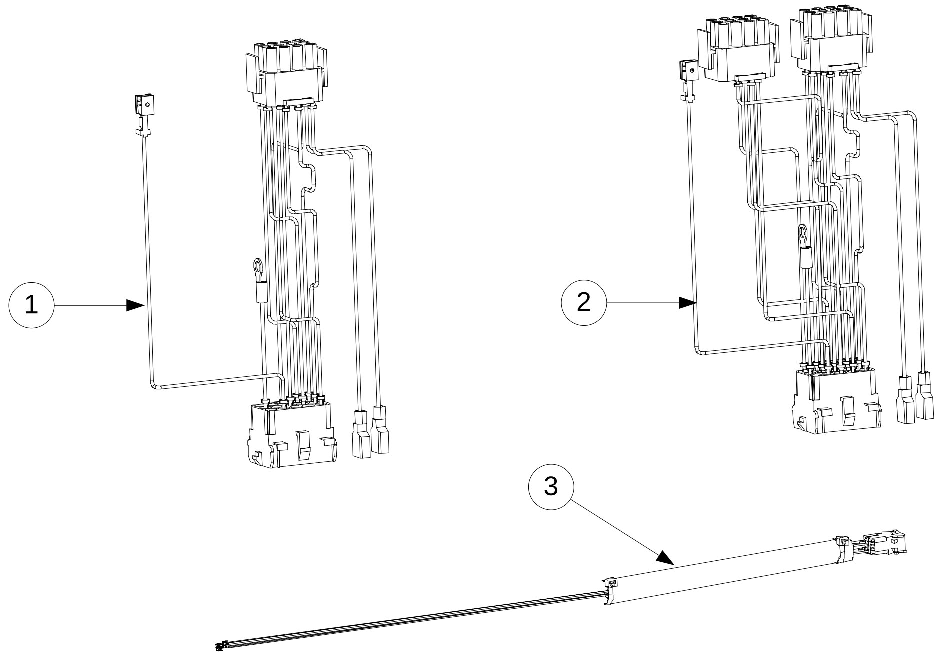


FULL VAT HARNESS
807-4194



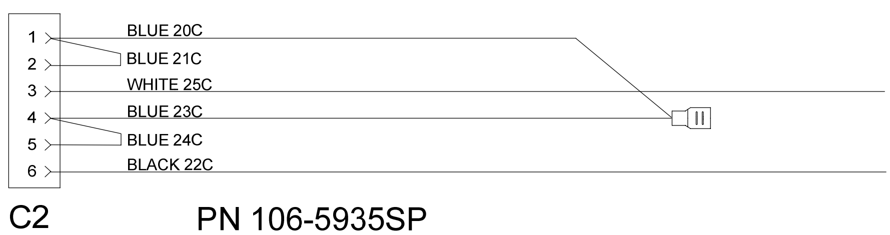
DUAL VAT HARNESS
807-4195

2.4.5.6 Component Box and Filter Pump Wiring Harnesses

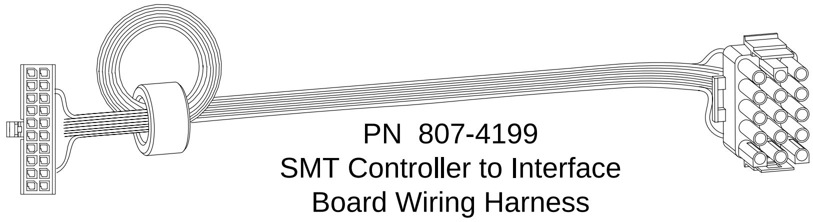


ITEM	PART #	COMPONENT
1	106-5750SP	Full Vat Control Harness J4 to J2 ***(Standard)***
	106-6639	Full Vat Control Harness J4 to J2 ***(EPRI)***
2	106-5751SP	Dual Vat Control Harness J4 to J1 and J2 ***(Standard)***
	106-6644	Dual Vat Control Harness J4 to J1 and J2 ***(EPRI)***
3	106-5935SP	Filter Pump C2 to Component Box Wiring Harness

2.4.5.7 Component Box to Filter Pump Harness



2.4.5.8 Interface Board to Controller Wiring Harness – 15-Pin



2.4.5.8 M2007, MIB, AIF and ATO Wiring Harnesses

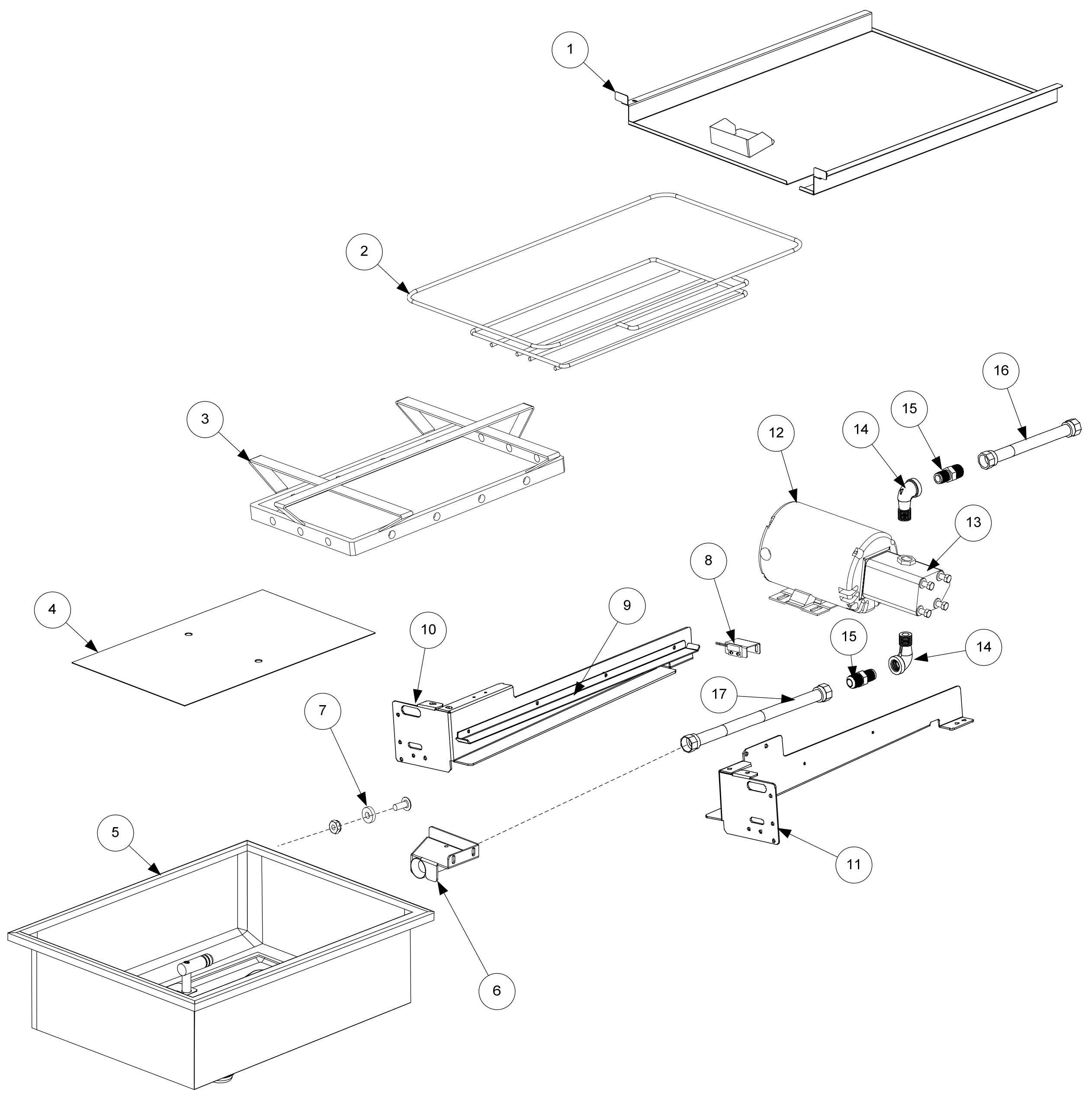
ITEM	PART #	COMPONENT
*	807-4546	Computer Communication *(used from Computer to Computer)*
*	807-4547	AIF Communication/Power *(used from MIB to AIF and AIF to AIF)*
*	807-4649	MIB Power/Blue LED/Pan Sw *(used from Transformer and Fltr Rly to MIB to Blue LED and Pan Sw)*
*	807-4655	FV/DV Harness RTD Medium *(used from RTD to ATO Board)*
*	807-4654	FV/DV ATO/RTD Probe
*	807-4621	FV/DV Harness RTD Short *(used from RTD to ATO Board)*
*	807-4553	ATO Power *(used from Transformer to ATO Board)*
*	807-4671	ATO Pump and JIB *(used from ATO Board to Top-off Pump and JIB Reset Switch)*
*	807-4555	ATO Yellow LED *(used from ATO Board to Yellow LED)*
*	807-4573	Computer Locator Wire *(used from Computer to Interface Board) See wiring diagram 805-1734 for locator pin positions.*
*	807-4552	Communications Terminator *(used on Computer pin J6 and ATO board pin J10 to terminate network)*
	807-4657	Jumper *(used on 4 and 5 battery ATO board plug J5 pin 7 and 8)*
*	106-9256SP	Long Top-off Power *(used between Component Box to ATO Box)*
*	807-4660PK	SMT Pin Service Repair Kit
*	230-2345	SMT Pin Extractor

* Not illustrated.

See page 1-14, 1-18, 1-27 and 1-36 for Pin Positions.

2.5 Filtration System Components

2.5.1 Filtration Components



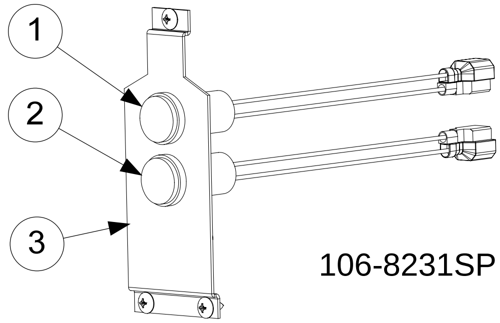
2.5.1 Filtration Components cont.

ITEM	PART #	COMPONENT
1	823-6560	Lid, Multi-Vat Fryers, Standard Size Filter Pan
	823-6684	Lid, Multi-Vat Fryers, Standard Size Filter Pan *(France Only)*
	823-6362	Lid, Two-Vat Fryer, Half Size Filter Pan
	823-6162	Lid, Two-Vat Fryer, Half Size Filter Pan *(France Only)*
2	810-3276	Crumb Tray, Standard Size Filter Pan 3, 4 and 5 Vat
	810-3288	Crumb Tray, Two-Vat Fryer, Half Size Filter Pan
3	810-3268	Hold-Down Ring for Pad 16.56 x 22.32, Standard Size Pan 3, 4, and 5 Vat
	810-3289	Hold-Down Ring for Pad 11.20 x 19.10, Two-Vat Fryer, Half Size Filter Pan
4	200-2240	SanaGrid Filter Screen, Standard Size Filter Pan
	220-2901	SanaGrid Filter Screen, Two-Vat Fryer, Half Size Filter Pan
5	106-8677	Pan, One-Piece Filter LOV™ Standard Size
	106-9148	Pan, One-Piece Filter LOV™ Standard Size *(France Only)*
	106-8211SP	Pan, Two-Vat Fryer, LOV™ Half Size
	106-8435	Pan, Two-Vat Fryer, LOV™ Half Size *(France Only)*
6	823-6715	Suction Tube Standard LOV™
	823-6164	Suction Tube Standard LOV™ *(France Only)*
	823-6399	Suction Tube Two Vat LOV™
7	810-3007	Magnet, Pull Ring
8	106-9251	Assembly, Filter Pan Switch Three Vat or more (106-5876SP Sensor only)
	106-8080	Assembly, Filter Pan Switch Two Vat (106-5876SP Sensor only)
*	106-5876SP	Sensor, Magnet
9	220-3879	Rail, Filter Pan Retaining Standard
	230-2999	Rail, Filter Pan Retaining Two Vat
10	220-3748	Support, Left Filter Pan
	220-3275	Support, Left Filter Pan Two Vat LOV™
11	220-3749	Support, Right Filter Pan
	106-8487	Support, Right Filter Pan Two Vat LOV™
12		Motor and Gasket Kit
	826-1785	100V 50/60 Hz
	826-1712	115V 50/60 Hz
	826-1756	208V 50/60 Hz
	826-1270	220-240V 50/60 Hz
	826-1755	250V 50/60 Hz
13	810-3071	Pump, Viking 8 GPM (requires gasket below)
	816-0093	Gasket, Pump/Motor
*	807-11973	Viking Pump Seal Kit
*	809-1020	Cap Screw, 5/16-inch-18 5.50" NC Hex *(Connects pump to motor.)*
14	813-0165	Elbow, ST ½-inch x ½-inch NPT 90° BM
15	810-1668	Adapter, ⅝-inch to ½-inch NPT Male
16	810-1067	Flexline, 8.5-inch Oil Return
17	810-1057	Flexline, 13-inch Oil Return
*	826-1392	O-Ring (Pkg. of 5; used with Item 5)
*	813-0568	Plug, ⅛-inch Socket Head Pipe (used with Item 5; two required)
*	106-5911	Heater Strip Assembly, 100-120V 25W 18"
*	106-5912	Heater Strip Assembly, 208-250V 25W 18"

* Not illustrated.

2.5.2 Auto Intermittent Filtration Components

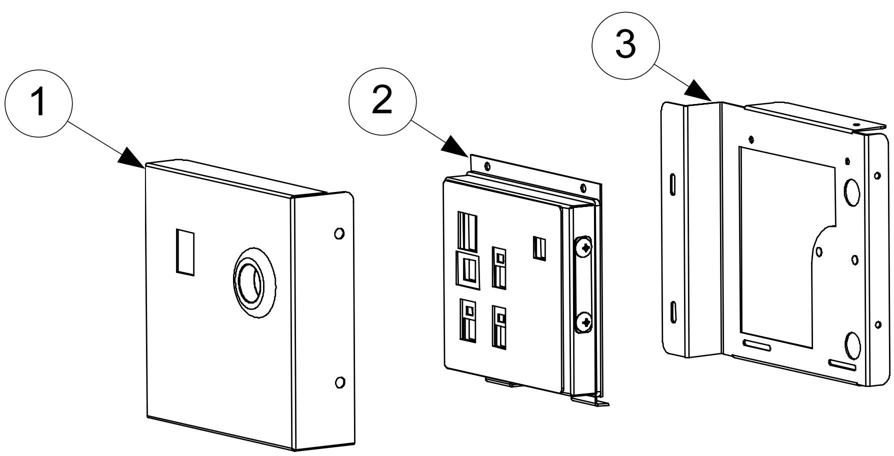
2.5.2.1 LOV™ Indicator Lights Assembly



106-8231SP LOV™ Panel Assembly

ITEM	PART #	COMPONENT
1	106-8106SP	Light, Blue 24VDC LED Flush
2	106-8105SP	Light, Yellow/Orange 24VDC LED Flush
3	230-4271	Plate, Control Frame LOV™

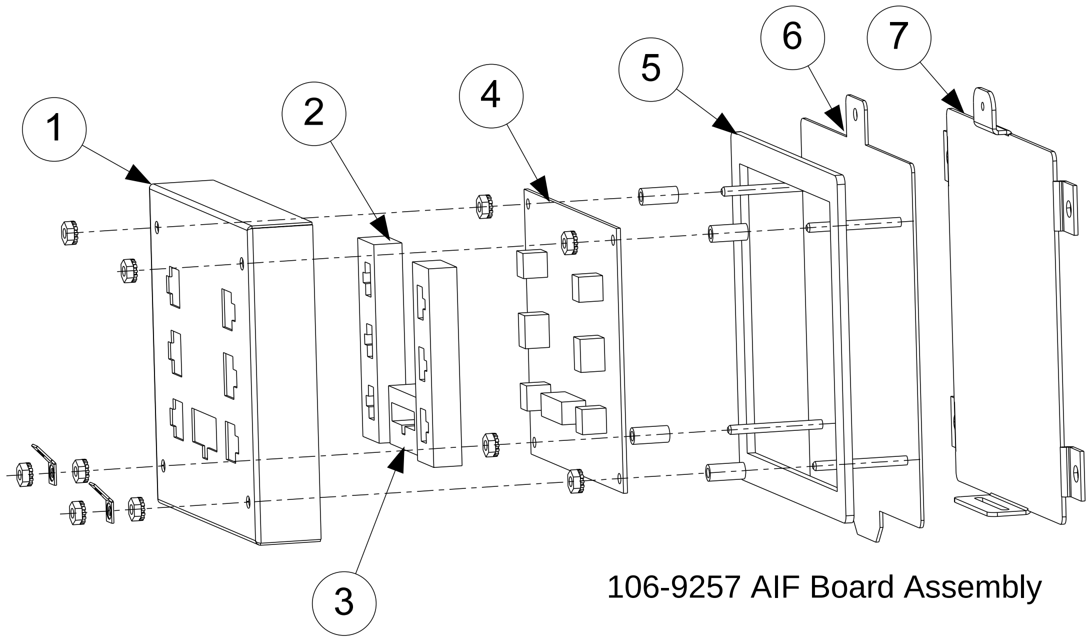
2.5.2.2 Manual Interface Board Assembly



106-9642 Manual Interface Board Assembly

ITEM	PART #	COMPONENT
1	230-4868	Cover, MIB
2	106-9246	Assembly, MIB Computer w/ Frame
	106-9609SP	Board, PCB MIB
	807-4481	Overlay
3	106-9643	Assembly Back, Box MIB

2.5.2.3 AIF Board Assembly



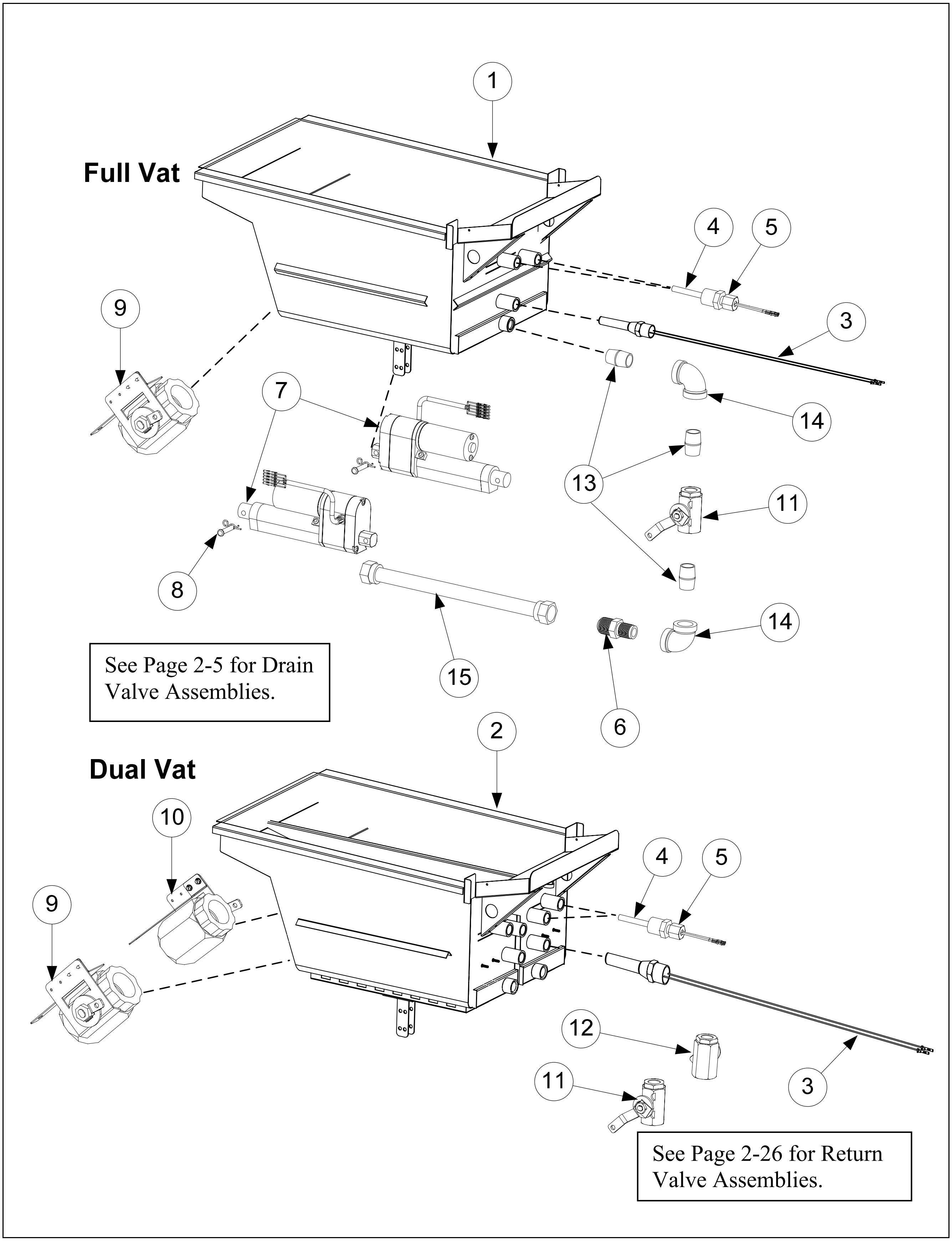
106-9257 AIF Board Assembly

ITEM	PART #	COMPONENT
1	824-1891	Cover, AIF Board
2	816-0748	Gasket, AIF Board
3	816-0749	Gasket, Computer Board
4	106-9608SP	Board, AIF
5	816-0769	Seal, AIF Board
6	106-8591	Assembly, AIF Box
7	220-3697	Mount, AIF Box

2.5.2.4 LOV PCB Board Matrix

CURRENT PART #	COMPONENT
106-9609SP	Board, MIB PCB
106-9246	Assembly, MIB Board w/ metal frame
106-9642	Assembly, MIB with cover and back
106-9608SP	Board, AIF Board PCB
106-9257	Assembly, AIF Board w/ metal frame
106-9610SP	Board, ATO PCB
106-9260	Assembly, ATO Board Box 120V
106-9261SP	Assembly, ATO Board Box 208-240V

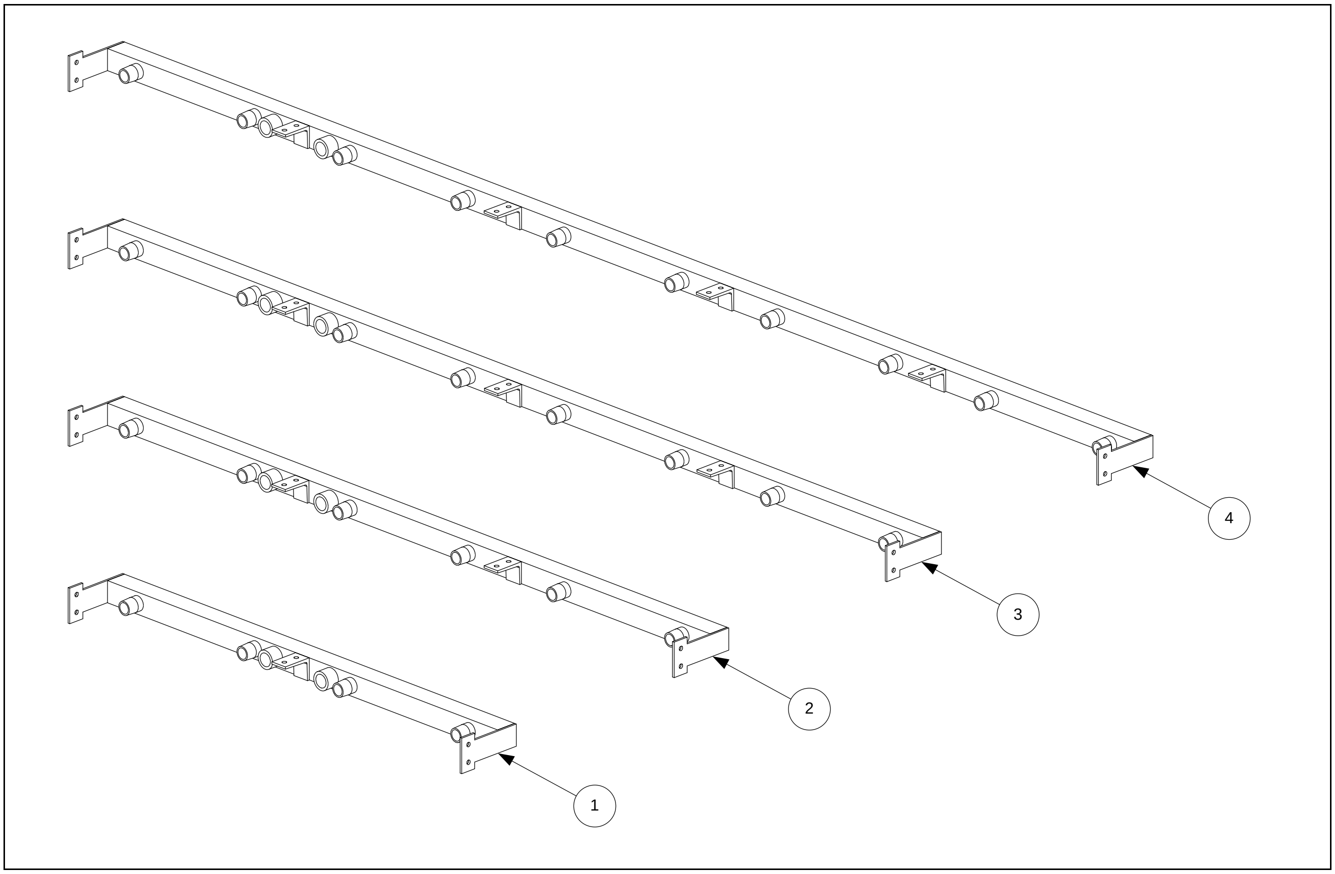
2.6 Frypot Assemblies and Associated Parts



2.6 Frypot Assemblies and Associated Parts cont.

ITEM	PART #	COMPONENT
1	823-6601	Frypot, Full-Vat LOV™
2	823-6602	Frypot, Dual-Vat LOV™ (use 823-6522 for LOV™ Fish frypot only)
3		Thermostat Assembly, High-Limit Long Standard
	826-2454	Non-CE Full Vat 425°F (218°C) (17kW FV and 14kW FV) (Color Coded Black 806-7543)
	826-2456	Non-CE Dual Vat 435°F (224°C) (22kW, 17kW DV and 14 kW DV) (Color Coded Red 806-8035)
	826-2455	CE Full and Dual Vat 415°F (213°C) (14kW and 17kW CE) (Color-Coded Yellow 806-8132)
4	807-4654	Probe, Temperature Shielded AIF/RTD
5	813-0617	Fitting, 3/16" x ¼" NPT
6	810-1668	Adaptor, Male ⅝" OD x ½"
7	807-4380	Actuator, Linear AIF 24VDC
8	809-1012	Pin, Clevis, ¼" x 1¼"
	810-1776	Cotter Vertical and Toaster Ring Pin
9	106-6807SP	Valve, Drain Assy. LOV™ AIF FV or DV Right as viewed from front of frypot.
10	106-6808SP	Valve, Drain Assy LOV™ AIF DV Left as viewed from front of frypot.
11	106-6809SP	Valve, Return Assy LOV™ AIF FV or DV Right as viewed from front of frypot.
12	106-6810	Valve, Return Assy LOV™ AIF DV Left as viewed from front of frypot.
13	813-0022	Nipple, ½" x Close NPT BM
14	813-0062	Elbow, ½" BM x 90°
15	810-1067	Flexline, ⅝" OD x 8.50" Long

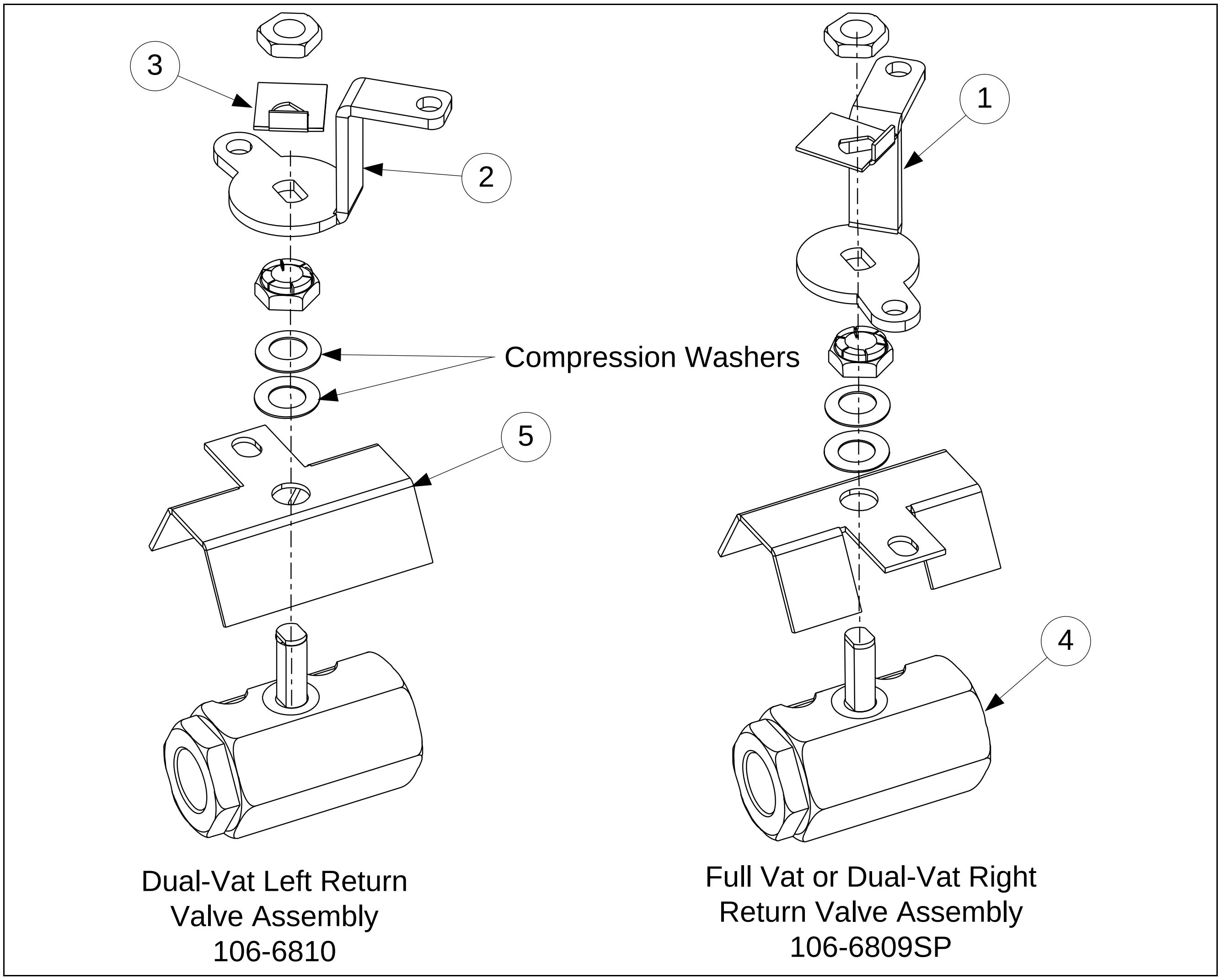
2.7 Oil Return System Components



ITEM	PART #	COMPONENT
1	810-3015	Manifold, Two-Station Fryer
2	810-3016	Manifold, Three-Station Fryer
3	810-3017	Manifold, Four-Station Fryer
4	810-3018	Manifold, Five-Station Fryer
*	813-0907	Cap, 15/16-inch Valve

* Not illustrated.

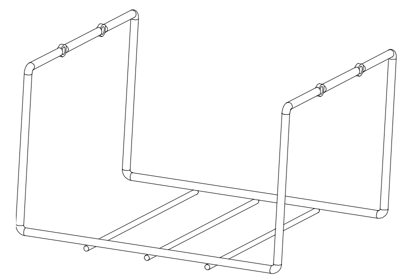
2.8 Return Valves and Associated Parts



ITEM	PART #	COMPONENT
1	232-4992	Handle, Return Valve with Locator Autofilter FV or DV Right
2	231-4992	Handle, Return Valve with Locator Autofilter DV Left
3	900-2935	Retainer, Nut Oil Return Valve
4	810-0278	Valve, ½-inch Ball
5	220-4994	Bracket, Return Switch Autofill

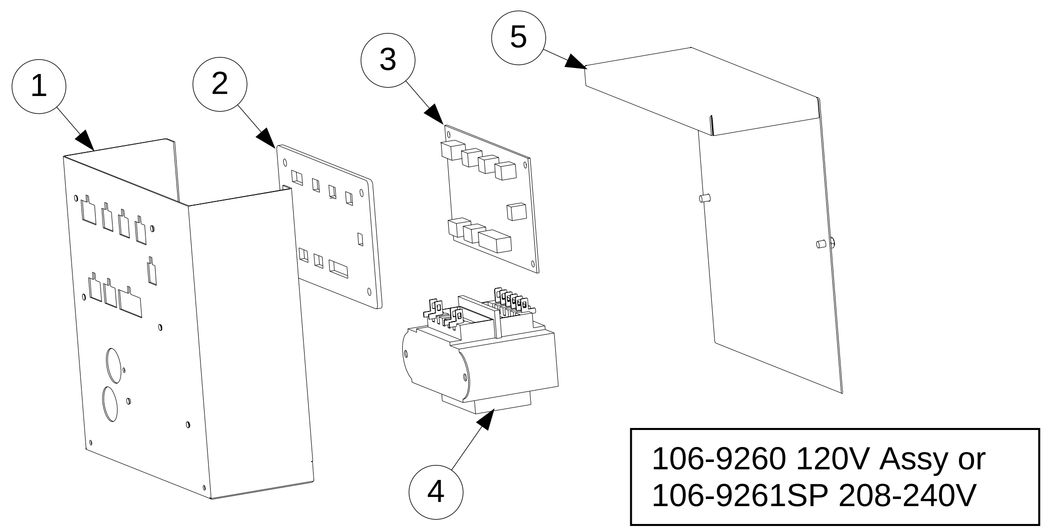
2.9 Auto Top Off Components

2.9.1 JIB Basket



ITEM	PART #	COMPONENT
1	810-3277	Basket, JIB LOV™

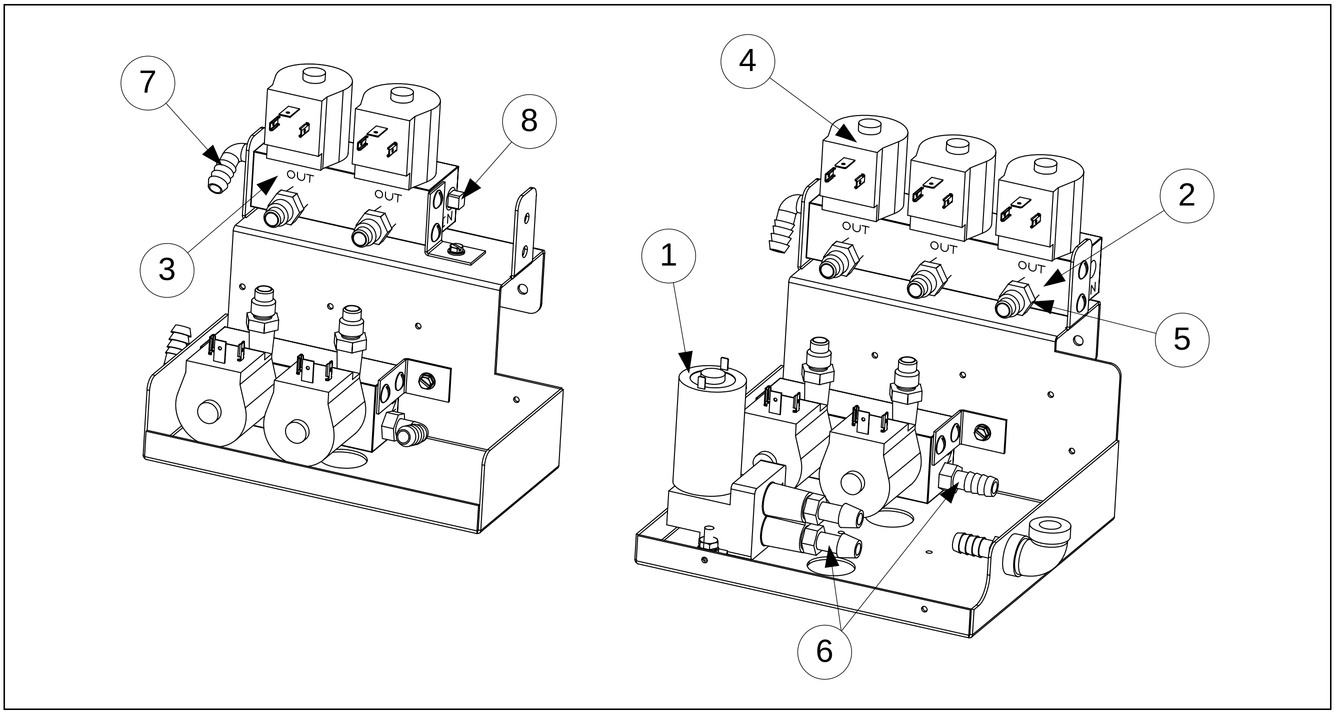
2.9.2 Automatic Top Off Board Assembly



ITEM	PART #	COMPONENT
1	106-9259	Box, Assembly Auto Top Off 2 Board RTD (use 106-8913 for 2-Vat RTD)
2	816-0747	Seal, Top Off Board
3	106-9610SP	PCB Board, Automatic Top Off 2 RTD
*	807-4698	PCB Board, LON Works
4	807-1999	Transformer, Dual Voltage 208-240V
	807-2176	Transformer, Dual Voltage 120V
5	220-4352	Cover, Top Off Board 3, 4 or 5-Vat
	220-3987	Cover, Top Off Board 2-Vat
*	807-3575	Plug, Carling Switch Hole

* Not illustrated.

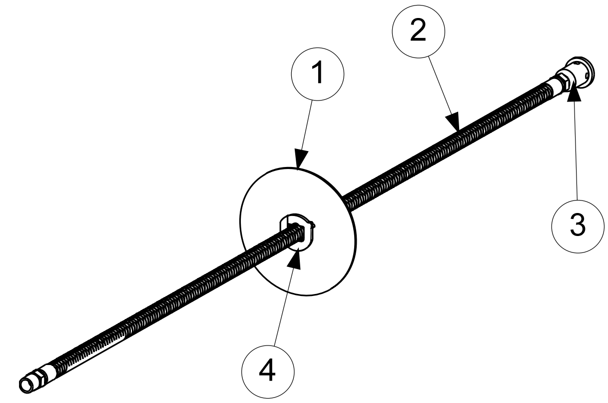
2.9.3 Solenoid and Pump Assemblies



ITEM	PART #	COMPONENT
1	807-4336	Pump, ¼ FNPT 12VDC, 19PSI 15.1GPH
2	807-4412	Solenoid Manifold Top-Off (includes three solenoid assemblies)
3	807-4587	Solenoid Manifold Top-Off (includes two solenoid assemblies)
4	807-4590	Solenoid
5	810-3270	Fitting, ⅜ Flare x ¼ NPT
6	816-0708	Fitting, ¼ NPT x ½ Male Barb
7	816-0710	Fitting, ¼ NPT x ½ Barb 90°
8	813-0640	Plug, ¼ NPT SQ HD BM
*	811-1139	Tubing, Braided Silicone 20-inch
*	810-3266	Flexline, ½" OD x 19.5-inch (used between solenoid and top off port)
*	810-3265	Flexline, ½" OD x 24-inch (used between solenoid and top off port)
*	810-3263	Flexline, ½" OD x 36-inch (used between solenoid and top off port)
*	810-3264	Flexline, ½" OD x 42-inch (used between solenoid and top off port)

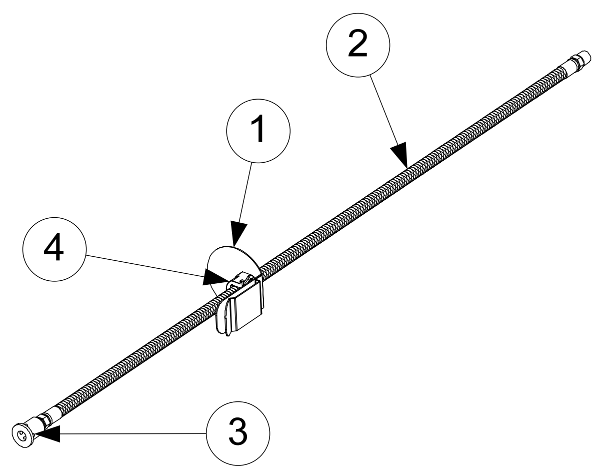
* Not illustrated.

2.9.4 JIB Cap and Pick Up Assembly



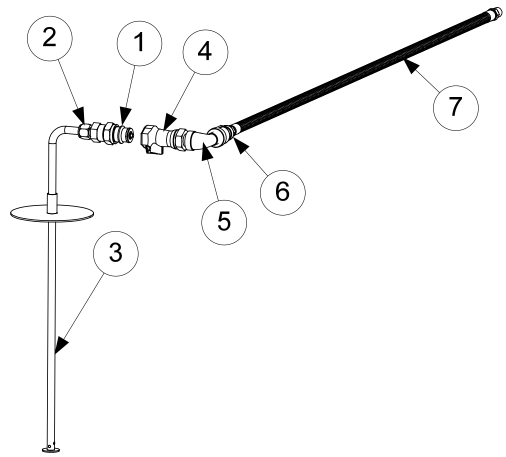
ITEM	PART #	COMPONENT
	106-8512SP	Cap, JIB Assembly
1	230-3737	Cap, JIB
2	810-3242	Hose, JIB
3	810-3300	Inlet, Oil Reservoir Tube
4	810-3334	Bushing, Heyco

2.9.5 BIB Cap and Pick Up Assembly (Used Internationally)



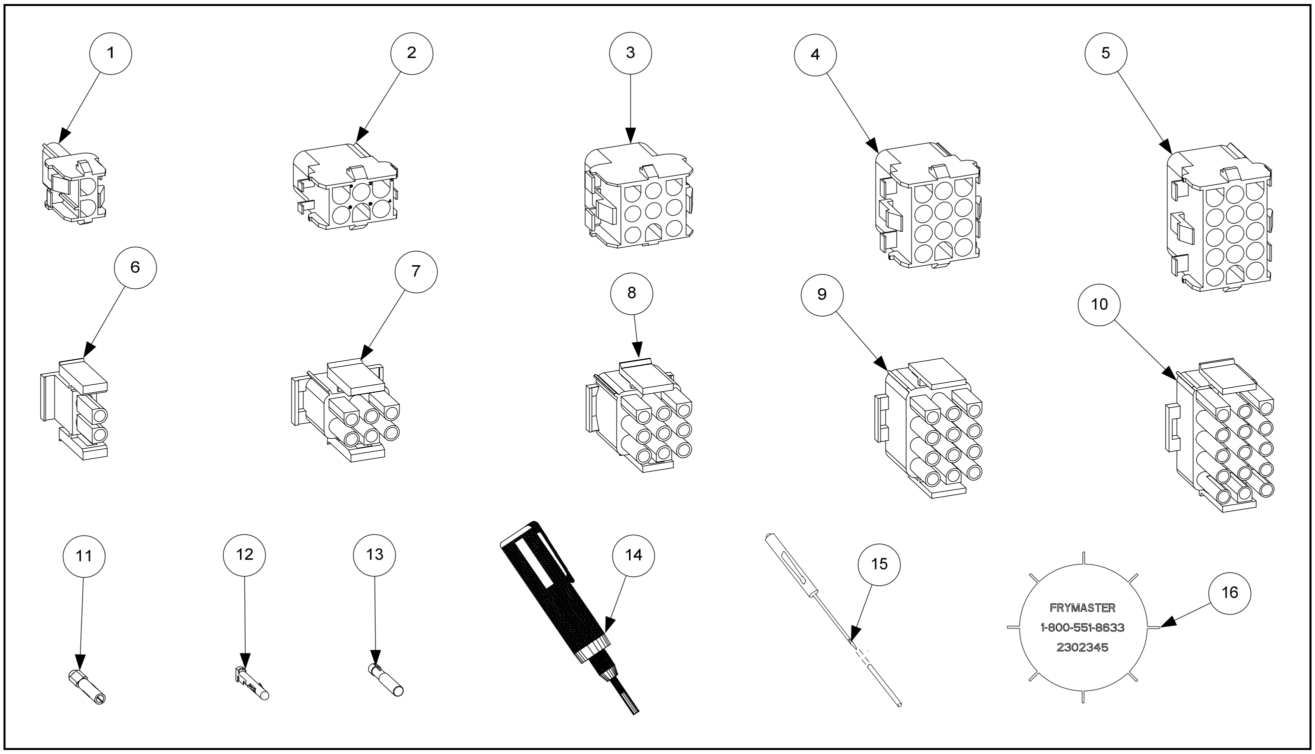
ITEM	PART #	COMPONENT
	106-9495SP	Cap, BIB Assembly
1	823-6812	Cap w/ Clamp, BIB Assembly
2	810-3242	Hose
3	810-3300	Inlet, Oil Reservoir Tube
4	810-3334	Bushing, Heyco

2.9.6 JIB Universal Cap and Pick Up Assembly



ITEM	PART #	COMPONENT
	106-8426	Cap, Universal Top Off Pick Up Assembly
1	810-3345	Fitting, Coupling Inset ⅜” NPT
2	813-0947	Fitting, Compression ⅜” Female x ⅜” Tubing
3	823-6391	Assembly, Cap Universal JIB
	106-8303	Hose Assembly, Universal JIB
4	810-3344	Fitting, Coupling Body ⅜” NPT
5	813-0869	Elbow, ⅜” Street SS
6	813-0944	Reducer, ¼” x ⅜” Female SS
7	810-3242	Hose, LOV™ Fryer JIB

2.10 Wiring Connectors, Pin Terminals and Power Cords



ITEM	PART #	COMPONENT
		Power Cords
*	807-0154	100/120V–15A 3-wire, w/grounded plug
*	807-4317	100/208/240V-16A 3-Wire with Plug LOV CE
*	807-1685	100/208/240V–18A 3-wire, w/o plug
*	807-4316	120V 5-wire, w/grounded plug LOV
*	807-3817	208/240V 3-Phase 4-wire w/grounded plug
		Connectors and Tools
1	807-1068	2-Pin Female
2	807-0158	6-Pin Female
3	807-0156	9-Pin Female
5	807-0159	12-Pin Female
5	807-0875	15-Pin Female
6	807-1067	2-Pin Male
7	807-0157	6-Pin Male
8	807-0155	9-Pin Male
9	807-0160	12-Pin Male
10	807-0804	15-Pin Male
11	826-1341	Terminal, Female Split Pin (Pkg of 25)
12	826-1342	Terminal, Male Split Pin (Pkg of 25)
13	807-2518	Plug, Mate-N-Lock (Dummy Pin)
14	807-0928	Extract Tool Pin Pusher
15	806-4855	Pin Pusher Screwdriver Assembly
16	230-2345	SMT Pin Extractor
*	807-4660PK	SMT Pin Service Repair Kit

* Not illustrated.

2.11 Fasteners

ITEM	PART #	COMPONENT
*	809-0429	Bolt, ¼-inch – 20 x 2.00-inch Hex Head ZP Tap
*	809-0131	Bolt, ¼-inch -20 x ¾-inch Hex
*	809-1020	Cap Screw, 5/16-inch-18 5.50" NC Hex *(Connects pump to motor.)*
*	809-0448	Clip, Tinnerman
*	826-1366	Nut, 4-40 Keps Hex (Pkg. of 25) (809-0237)
*	826-1358	Nut, 6-32 Keps Hex (Pkg. of 25) (809-0049)
*	809-0247	Nut, 8-32 Keps Hex
*	826-1376	Nut, 10-32 Keps Hex (Pkg. of 10) (809-0256)
*	809-0766	Nut, 10-32 Keps Hex SS
*	809-0581	Nut, ½ NPT Locking
*	809-0020	Nut Cap 10-24 NP
*	826-1372	Nut Grip ¼-inch ¼-20 Hex NP (Pkg. of 10) (809-0059)
*	809-0417	Nut Flange ¼-inch ¼-20 Serr
*	809-0535	Nut, "T" ¼-inch-20 x 7/16 SS
*	809-0495	Nut, ¼-inch – 20 Press
*	809-0540	Nut, Lock ½-inch-13 Hex 2-Way ZP
*	826-1359	Screw, 4-40 x ¾-inch Slotted Round Head (Pkg. of 25) (809-0354)
*	826-1365	Screw, 6-32 x ⅜-inch Slot Head (Pkg. of 25) (809-0095)
*	809-0357	Screw, 6 x ⅜-inch Phillips Head NP
*	809-0359	Screw, 8 x ¼-inch Hex Washer Head
*	809-0360	Screw, 8 x ⅜-inch Hex Washer Slot Head
*	826-1371	Screw, 8 x ½-inch Hex Head ZP (Pkg. of 25) (809-0361)
*	809-0364	Screw, 8 x ⅝-inch Hex Washer Head ZP
*	809-0518	Screw, 8-32 x ⅜-inch Hex Washer Slotted Head SS
*	809-0104	Screw, 8-32 x ½-inch Slotted Head ZP
*	826-1363	Screw, 8-32 x ½-inch NP (Pkg. of 25) (809-0103)
*	826-1360	Screw, 10-24 x 5/16-inch Round Slot Head ZP (Pkg. of 25) (809-0024)
*	826-1330	Screw, 10-32 x ⅜-inch Slot Head SS (Pkg. of 25) (809-0117)
*	809-1003	Screw, 10-32 x ⅜-inch Hex Trim Head SS
*	809-0270	Screw, 10-32 x ½-inch Phillips Head ZP
*	826-1375	Screw, 10-32 x ¾-inch Hex Trim Head SS (Pkg. of 5) (809-0401)
*	809-1000	Screw, 10-32 x 1¼-inch Hex Sck C/S
*	826-1374	Screw, 10 x ½-inch Hex Head (Pkg. of 25) (809-0412)
*	809-0266	Screw, 10 x ½-inch Phillips Head ZP
*	809-0434	Screw, 10 x ⅜-inch Hex Washer Head NP
*	809-0123	Screw, 10 x ¾-inch Slot Head
*	826-1389	Screw, 1/4-20 x ¾-inch Hex Head ZP (Pkg. of 10) (809-0131)
*	809-0582	Washer ½ NPT Locking
*	809-0184	Washer, #10 LK ZP
*	809-0190	Washer, .625 X .275 X 40 Flat SS
*	809-0191	Washer, Lock ¼ Spring ZP
*	809-0193	Washer, Flat ¼ Nylon
*	809-0194	Washer, Flat 5/16 ZP

Frymaster, L.L.C., 8700 Line Avenue, PO Box 51000, Shreveport, Louisiana 71135-1000
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